California Environmental Protection Agency

Air Resources Board

EMISSION FORECASTING and PLANNING INVENTORY DEVELOPMENT WORKSHOP

Fall 2004

EMISSION FORECASTING WORKSHOP
FALL 2004

November 17, 2004
Room 350
Air Resources Board
Cal EPA Headquarter
1001 I St, Sacramento, California

Call-in number: 1-888-381-5771
Passcode: 54530
Leader: Martin Johnson

8:30-9:00	Registration	
9:00-9:15	Workshop Overview	Martin Johnson
9:15-9:45	Overview of forecasted, planning, and modeling inventories	Martin Johnson
9:45-10:00	Break	
10:00-11:00	CEFS forecasting system design and analytical capabilities	Martin Johnson
11:00-12:00	Growth data development and transmittal (I)	Vivian Lerch
12:00-1:00	Lunch	
1:00-1:30	Growth data development and transmittal (II)	Vivian Lerch
1:30-2:30	Control data development and transmittal	Larry Hunsaker
2:30-2:45	Break	
2:45-3:45	Temporal data development and transmittal	Larry Hunsaker
3:45-4:00	Wrap-up and Questions	Martin Johnson

California Environmental Protection Agency

Air Resources Board

Emission Forecasting and Planning Inventory Development Workshop

Martin Johnson, Vivian Lerch, and Larry Hunsaker

Emission Inventory Branch

November 17, 2004

Principal Topics

1. Introduction to Forecasting and Planning Inventories
2. CEFS System Design and Analytical Capabilities
3. Input Data Set Construction & Transmittal
4. Wrap Up and Closing Remarks

Emission Inventory Overview

Types of Inventories

- Annual Average
- Planning
  - Summer Ozone Planning
  - Winter CO Planning
- Forecasted
- Gridded / Modeling

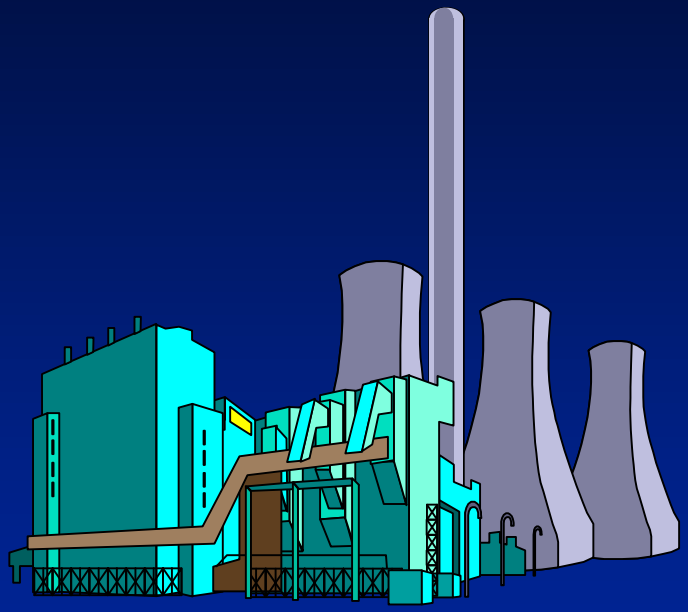
Criteria Pollutants

TOG: Total Organic Gases
ROG: Reactive Organic Gases
CO: Carbon Monoxide
NOX: Oxides of Nitrogen
SOX: Oxides of Sulfur
PM: Particulate Matter
PM10: Particulate Matter ≤ 10 Microns
PM2.5: Particulate Matter ≤ 2.5 Microns

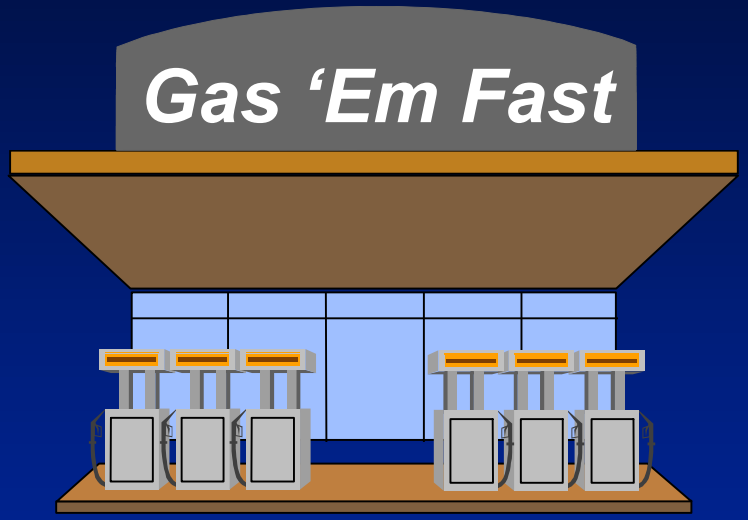
Types of Sources

- Stationary
- Area-Wide
- Mobile
- Non-Anthropogenic

Stationary Sources

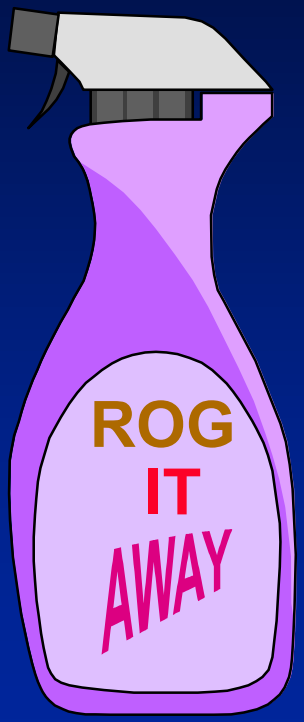


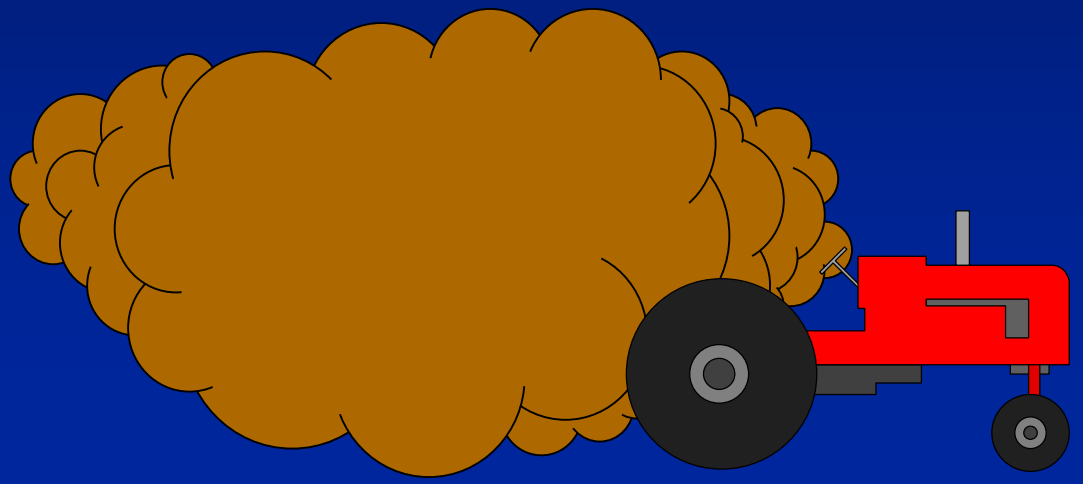
Point



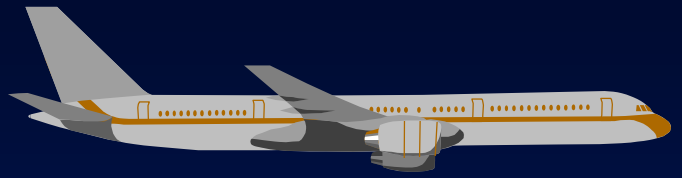
Aggregated Point

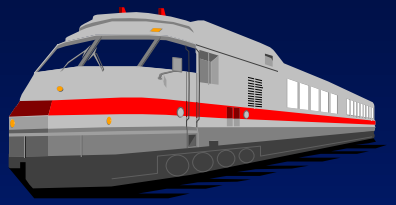
Area-Wide

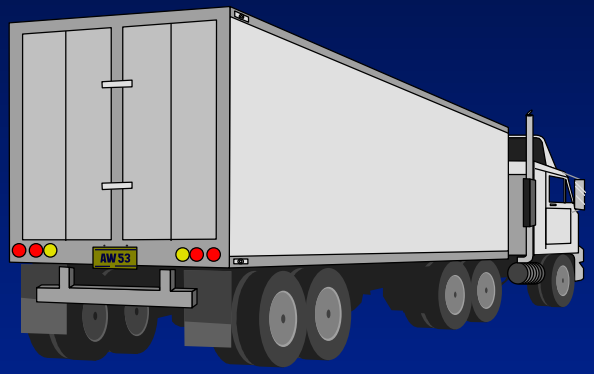




Mobile

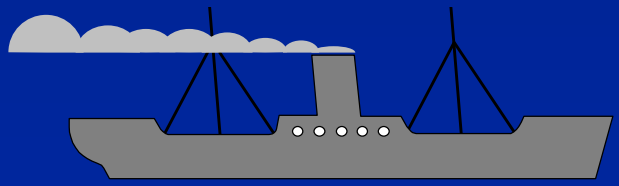




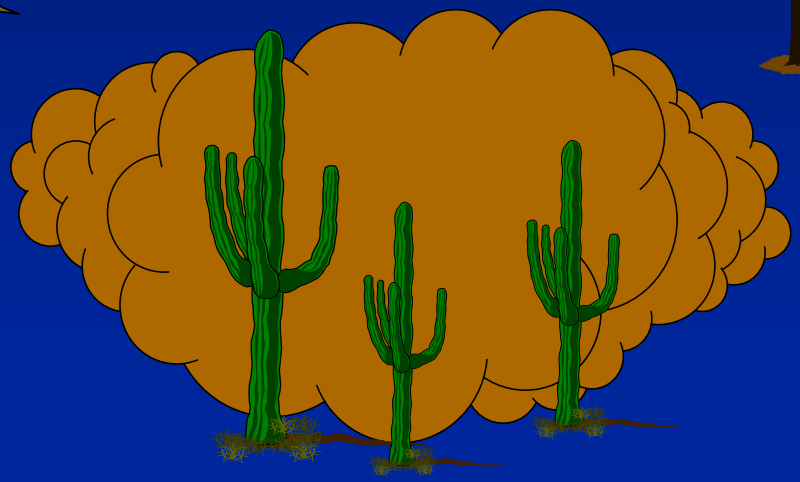


Non-Road

On-Road



Non-Anthropogenic



How Do We Identify and Categorize Sources?

- Point Sources
  - Combination of SCC and SIC Codes
  - Each SCC/SIC Combination is Mapped to an EIC
- Area Sources
  - Each category is assigned a unique EIC

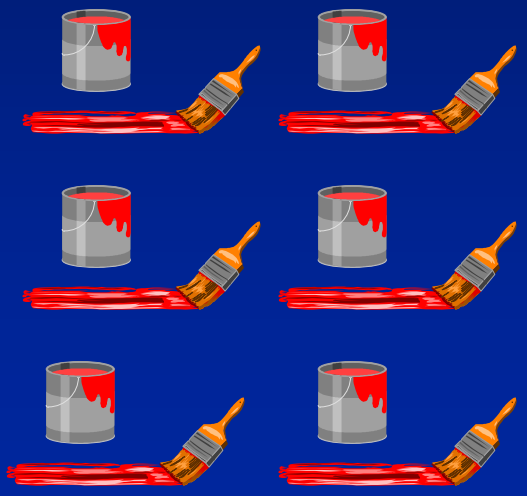
How Do We Estimate Emissions?

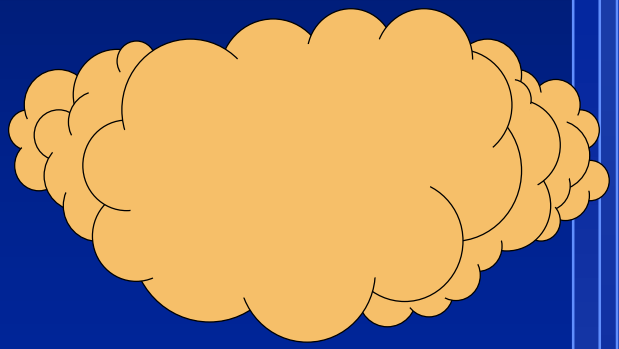
Emission Calculation

Process Rate (Activity)

Emission Factor

Number of Units **x** Emissions per Unit **=** **Total Emissions**





Responsibilities

- Local Districts
  - Develop Local Point Source Inventory
  - Estimate Emissions for 1/3 of Area Source Categories
- ARB
  - Estimate Mobile Source Emissions
  - Estimate Emissions for 2/3 of Area Source Categories
  - Develop and Report Statewide Inventory

CEIDARS

- The California Emission Inventory Development and Reporting System
- A Relational Database System
- Stores Annual Average Emissions for All Source Types

CEIDARS

- Reconciles Point and Area Source Emissions
- Also Stores Temporal and Spatial Data
- Provides Base Year Inventories for CEFS

Planning Inventories

Planning EI's

- What is a Planning Inventory ?
  - Planning Inventories are a refinement of annual emission inventories
  - Created only for non-attainment areas
  - Ozone or precursors (i.e. ROG and NOx), CO, SOx, and PM10 are the non-attainment pollutants considered at this time

Planning EI's
(continued)

- Purpose of Planning Inventories
  - To characterize emissions of a non-attainment pollutant (or its precursors) during air quality exceedance periods
  - A tool for air quality planners to assess what sources to target for emission reductions as required under the federal CAA

Planning EI's
(continued)

- Periods Analyzed
  - Ozone: summer operating period May-Oct (mainly concerned with ROG and NOx)
  - CO: winter operating period Nov-Apr
  - Other Periods: For the San Joaquin PM10 SIP, quarterly inventories were developed
- Two calculation methods--CEFS supports both methods

Old Calculation Method

- Point Sources

SEMS (t/d) = EMS (t/y) / {OP_DAY * WEEK_YR}

Where:

SEMS = Seasonal emissions (tons/seasonal day)

EMS = Annual Emissions (tons/year)

OP_DAY = # days of operation per week

WEEK_YR = # operating weeks per year

Old Calculation Method

- Area-wide sources

SEMS (t/d) = {EMS (t/y) * SUMMER_THROUGHPUT} / SUMOPDAY

Where:

SEMS = Seasonal emissions (tons/seasonal day)

EMS = Annual Emissions (tons/year)

SUMMER_THROUGHPUT = Sum of fractional monthly throughputs

SUMOPDAY = 184 (summer days) / 7 (days/week)

* OP_DAY (operating days/week)

New Calculation Method

(not implemented yet!)

SEMS (t/d) = EMS (t/y) * TF

Where:

SEMS = Seasonal emissions (tons/seasonal day)

EMS = Annual Emissions (tons/year)

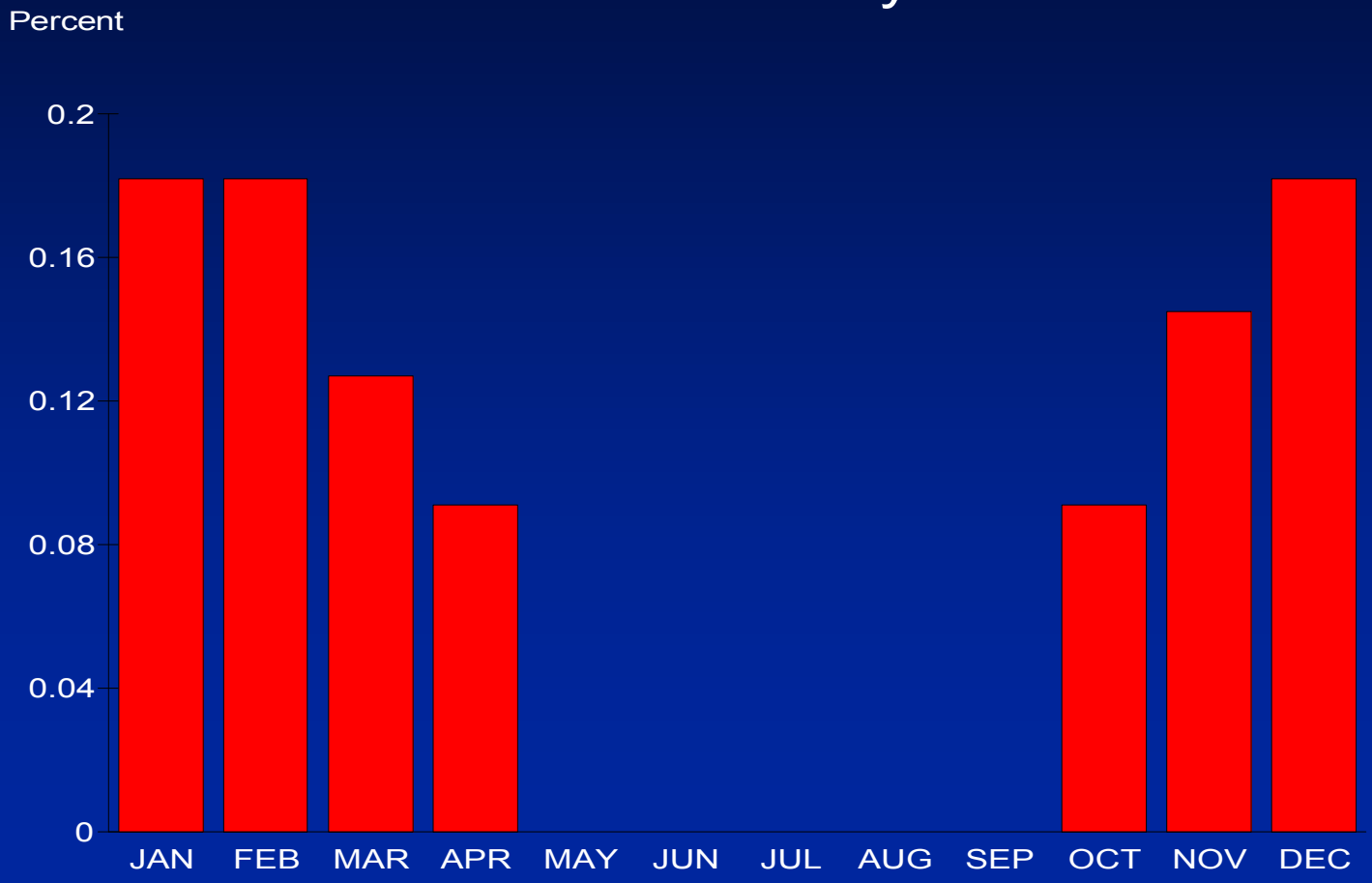
TF (Temporal Factor) = SEAS_FRAC / 182.5

SEAS_FRAC = (i) Sum of fractional monthly throughputs
Summer: May-October
Winter: November-April

or (ii) The ratio of the operating days in the season to the operating days in the year

Planning Inventories (cont)

Monthly Temporal Profile
Residential Fuel Combustion
Sacramento County



Emission Forecasting Overview

Introduction

- Computerized emission forecasting at CARB since 1981
- Used to predict future emission levels based on expectations of future economic conditions, population growth, and emission controls
- Used to develop baseline emission inventory projections for SIP and local AQMP's

Introduction (continued)

- Also used to backcast emissions (for historical years) to account for improved inventory methodologies
- Air basin and county level emission trends calculated for period 1975-2010

Socioeconomic and Demographic Growth Activity

Growth Factors

- What are growth factors?
  - Derived from county-specific economic activity profiles, population forecasts, and other socio/demographic activity

Growth Factors (Continued)

- Sources of growth activity data
  - District supplied data based on information from COGs
  - Economic activity studies contracted by ARB (e.g. Pechan, CSU Fullerton)
  - Demographic data (e.g. population estimates-DOF, VMT-Caltrans)
  - ARB development (e.g. livestock)

Growth Factors (Continued)

- How are growth factors linked to emissions?
  - **"Rule of Thumb"**: Growth profiles are typically associated with the type of industry and secondarily to the type of emission process.
    - **Point Sources**: Economic output profiles by industrial sector are linked to emission sources via SIC.

Growth Factors (Continued)

- **Area-wide and Aggregated Point Sources**: Other growth surrogates such as population, dwelling-units, fuel usage etc. may be used

  Example: Emissions from residential fuel combustion are generally linked to # of dwelling-units as a growth parameter

Control Factors

Control Factors

- What are control factors?
  - Control factors are derived from adopted ARB regulations or district rules which impose emission reductions or a technological change on a particular emission process
  - In general, control factors incorporate three components:
    - Control Efficiency
    - Rule Penetration
    - Rule Effectiveness

Control Factors (Continued)

- Sources of data
  - ARB Regulations:

    Control profiles are derived from adopted state regulations by ARB staff (e.g. consumer products, clean fuels, etc.)
  - District Rules:

    Control profiles are developed by district staff based on adopted district rules (e.g. IC engine rules)
  - Other regulatory agencies: DPR, U.S. EPA, etc.

Control Factors (Continued)

- How are control factors linked to emissions?
  - **"Rule of Thumb"**: Control data are closely linked to the type of emission process and secondarily to the type of industry
  - Control data are assigned to emission categories which are targeted by the rules

    (Formerly, control data were maintained by broad control category definitions. In the future controls will be rule-source specific.)

General Forecasting Equation

$E_{fy}(s,p) = E_{by}(s,p) * TF * GF * [CF(m_1,s,p) * CF(m_2,s,p) *...* CF(m_j,s,p)]$

where:

E_{fy} = Emissions in the future year
E_{by} = Emissions in the base year
where:
E_{by} = Process Rate * Emission Factor

TF = Temporal Factor
GF = Growth Factor (Growth Level FY / Growth Level BY)
CF = Control Factor (Control Level FY / Control Level BY)
s = The source category (SCC/SIC or EIC)
p = The pollutant
m = The control measure impacting the source category
j = The number of measures impacting the source category, s

On-Road Mobile Source Forecasts (EMFAC2000 Model)

Off-Road Mobile Source Forecasts (OFFROAD Model)

CEFS System Design and Analytical Capabilities

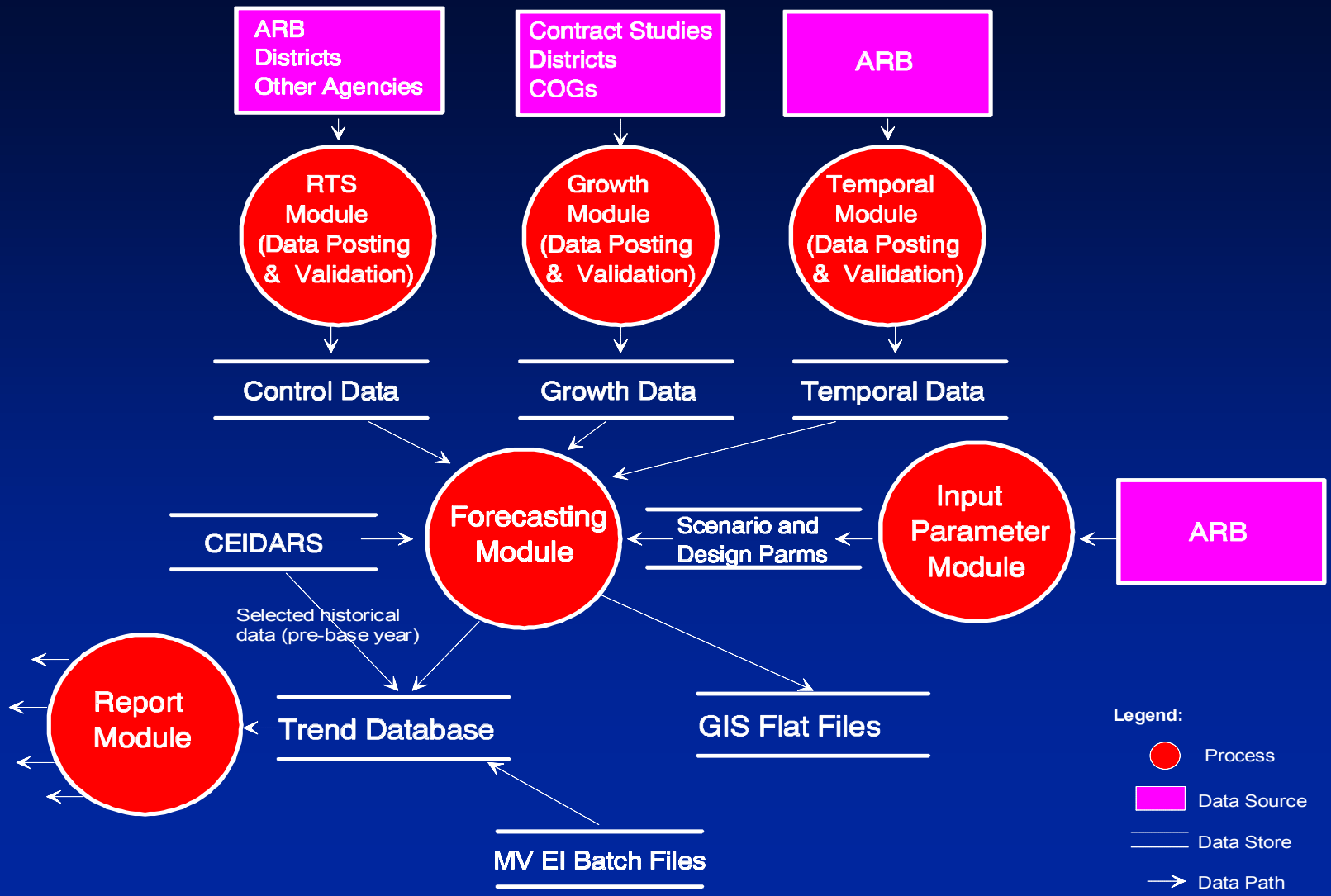
Introduction

- Changes in the forecasting business at ARB
  - Original forecasting programs operated on IBM 3270 mainframe in a RAMIS environment
  - Base year EI system redesigned in the 90's using the industry standard Oracle RDBMS environment--CEIDARS
  - Forecast system no longer compatible !!
  - Heightened interest in emission analyses to track SIP progress

Principal Design Objectives of the CEFS Project

- Compatibility with CEIDARS
- Improved forecasting logic needed
- Improved tracking of CAA emission reduction requirements (particularly for stationary sources)
- Improved temporal algorithms
- Day/Hour specific EI's for modeling
- Improved district accessibility to the system

CEFS Module View



Key Features of Algorithm Design

- Growth parameters linked to emission categories rather than broadly-defined growth categories
- Control rules linked to affected emission categories rather than broadly-defined control categories
  - Rule Effectiveness and Rule Penetration also supported

Key Features of Algorithm Design
(continued)

- Supports multiple rule/source application
- Complex region and category layering schemes for growth and control data
- Supports necessary switching of “adopted” and “proposed” control measures for SIP planning scenarios
- New “seasonal” and “day/hour” temporal algorithms for planning and modeling EI’s

Growth and Control Data Hierarchy

Region Selection:

1. District, Air Basin, County, Sub-County
2. District, Air Basin, County
3. Air Basin, County
4. County
5. Air Basin
6. District
7. California

Category Selection:

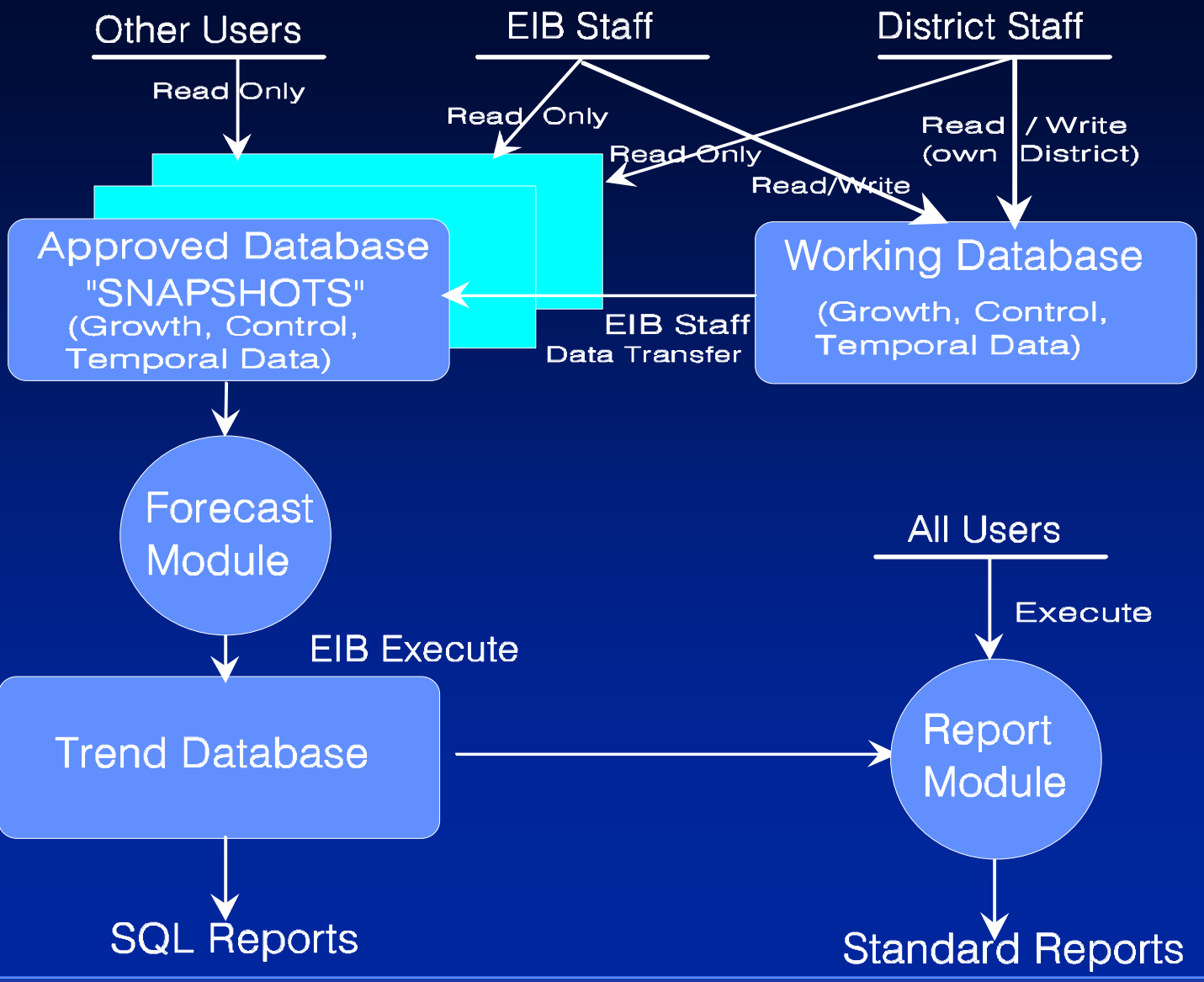
1. Facility, SCC, SIC
2. Facility
3. Facility, EIC
4. SCC, SIC
5. SCC6, SIC
6. SCC3, SIC
7. SCC
8. SIC
9. EIC, SIC
10. EIC
11. CES
12. SIC2
13. Facility, EIC, SIC

Note: Currently, options 1,2,3, and 13 are only available with GIS forecast module

System Design -- Overall

- Database design using Oracle RDBMS
- “Working” and “Approved” database concepts
  - “Working” = Living
  - “Approved” = Snapshot
- Forecast processor algorithms written in C
- Reporting algorithms written in C and PL/SQL
- User access rights and security
- Modular design
- Remote access capability via telnet or modem

CEFS User Access



Aggregate Category Level Analysis (CEFS/TREND program)

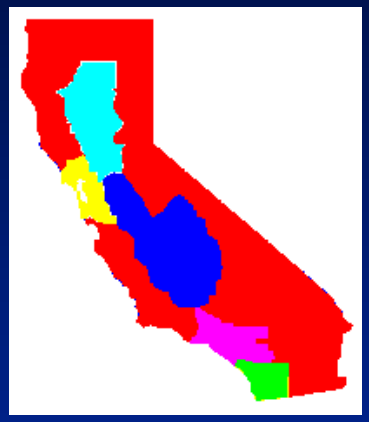
Annual Average Emission Trends

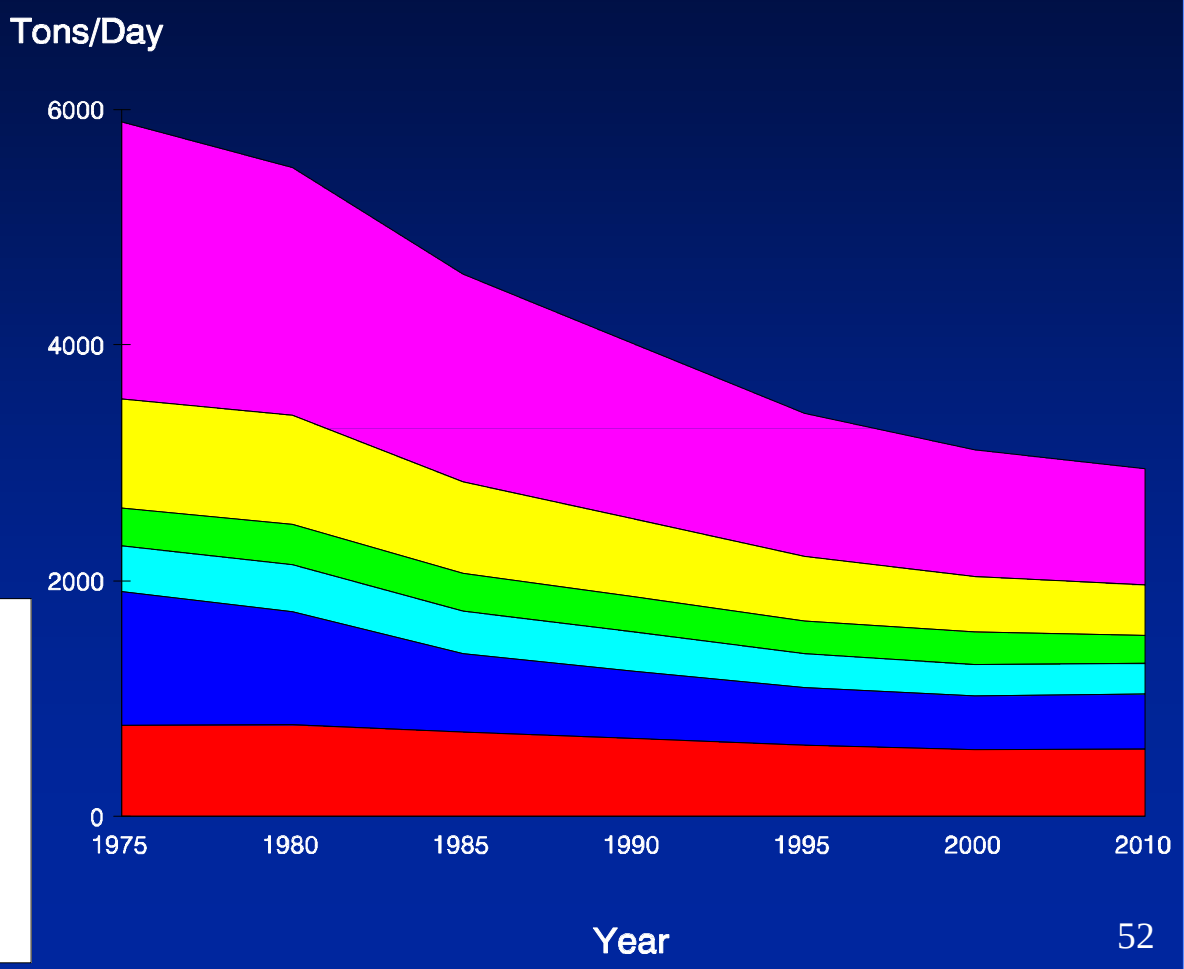
- Annual average emission trends are developed at the SCC/SIC, EIC level and reported using ARB's standard EIC division and subcategory convention
- Trend analyses focuses on the major emission changes which are evident in major emission sectors as a result of growth and / or control

Annual Average Emission Trends

- "Pre-base-year" period
  - Point Sources: All historical reported inventory data are retained
  - Areawide, aggregated point: These categories are backcasted to account for improvements in estimation methods
  - Other Mobile: Outputs from the OFFROAD model
  - On-Road: Outputs from the EMFAC model

Emission Trends "The Big Picture"





Planning Emission Projections

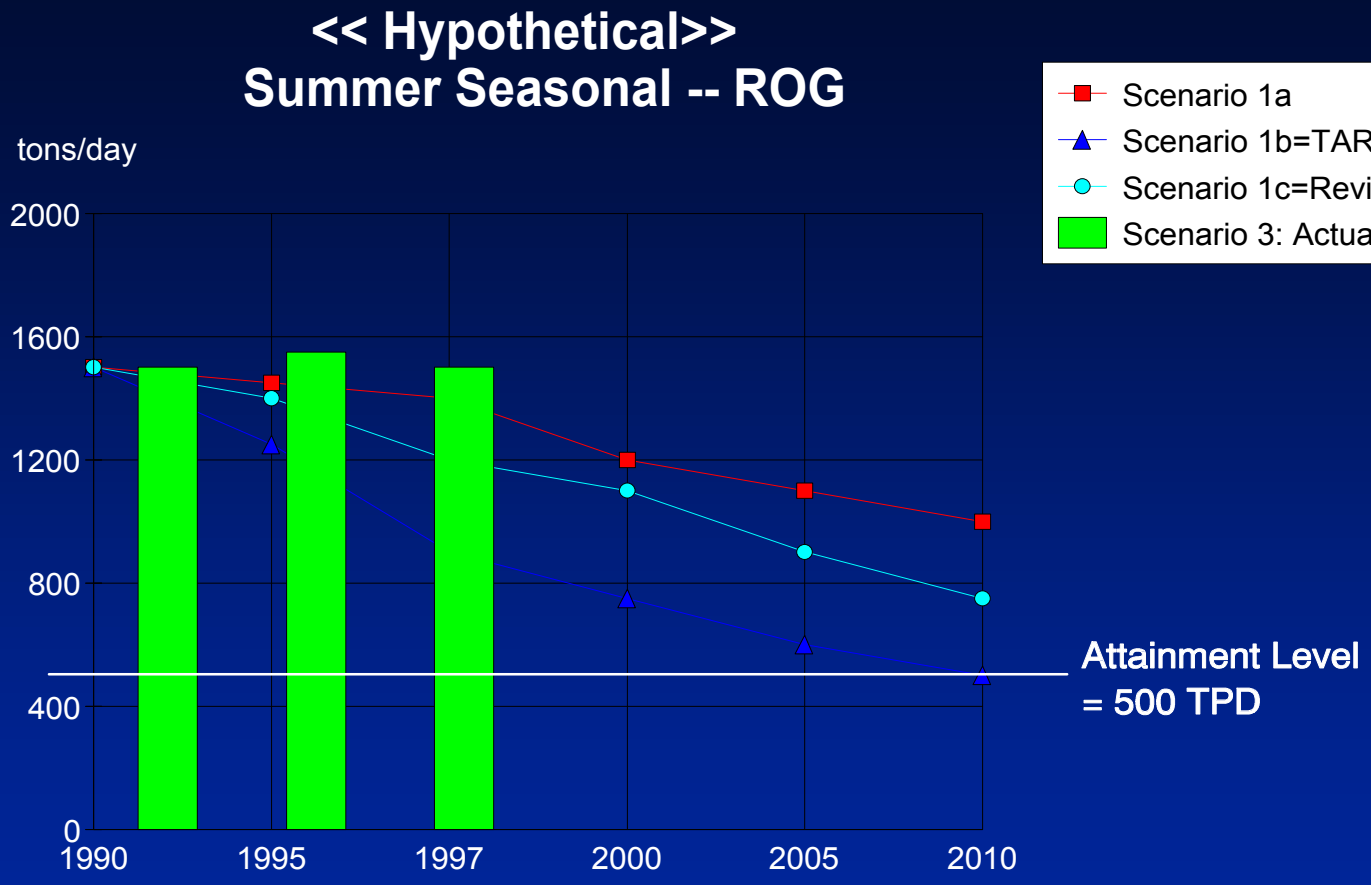
Planning Projections

- Planning Projection = Forecasted Seasonal Inventory by Emission Category (SCC/SIC, EIC)
  - Typically a summer season for ROG and NOx
  - Typically a winter season for CO
  - Other seasons or monthly periods possible
  - The starting place is to develop a baseline forecast which accounts for all adopted emission controls

Planning Projections (cont)

- Then develop a planning forecast which includes the adopted rules and proposed measures in the plan
- “What-if” scenario analysis for plan development

Planning Projections and SIP Tracking Scenarios



Reporting Parameters:
REGION
POLLUTANT
SOURCE_CAT
YEAR

SIP Progress Tracking

- Two basic questions and analytical levels:
  - (1) Does the control plan predict attainment from the point of view of required emission reductions for the inventory as a whole?
  - (2) Are the emission reduction requirements for the particular measure(s) being met?

SIP Progress Tracking

(continued)

What's Involved???

- Associate inventory controls to each individual rule or regulation
- "Frozen" plan inventory and updated working inventory projections with both adopted and planned measures
- Compare updated ("Recalibrated") projections to original plan targets

SIP Progress Tracking
(continued)

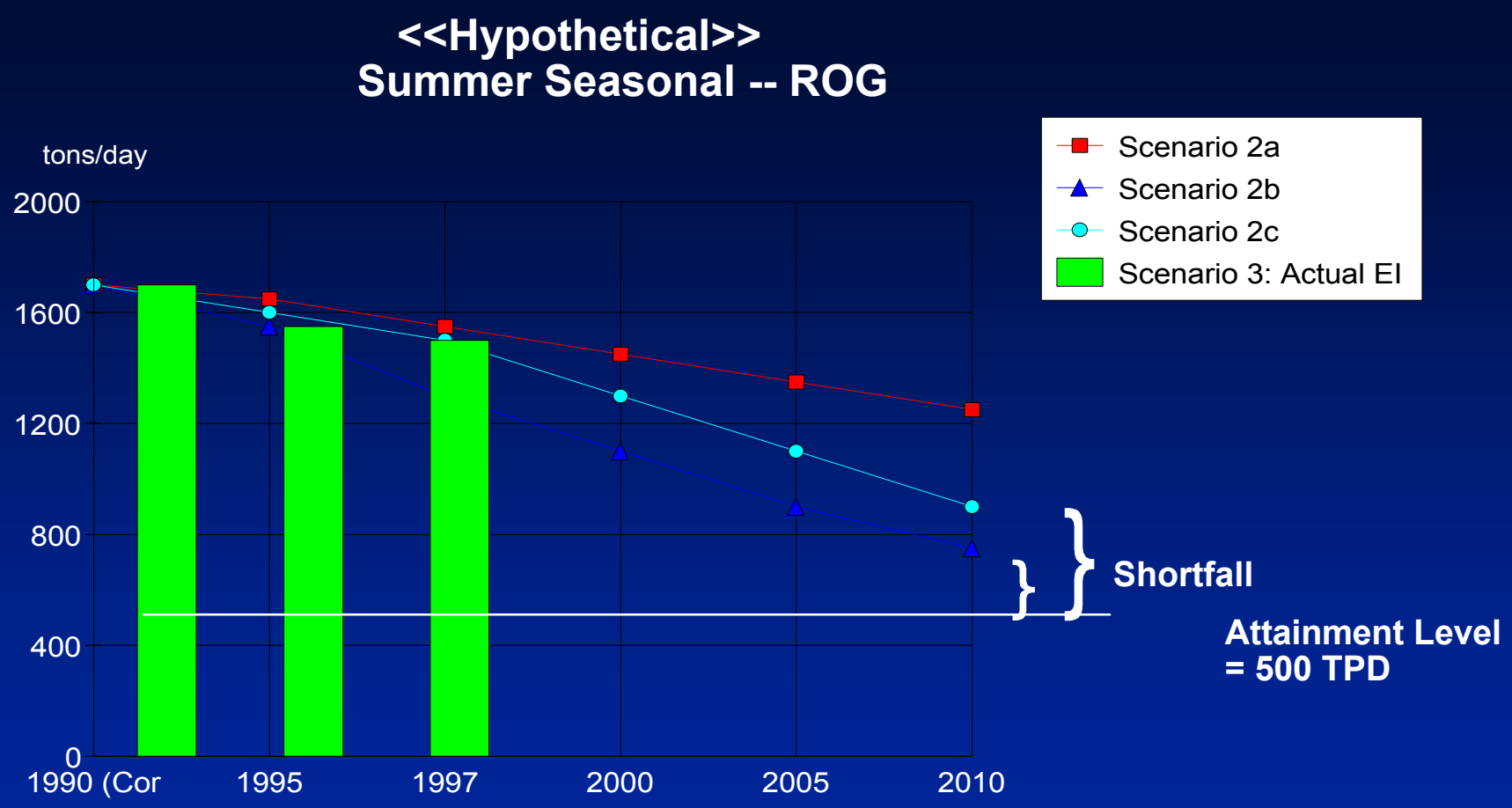
- Scenario 1:“Common Currency” Assessment
  - Uses the “frozen” 1990 EI as the benchmark
  - Growth assumptions are also “frozen” based on 1994 SIP scenario
  - Control levels are updated to reflect rules adopted since the SIP

SIP Progress Tracking

(continued)

- Scenario 2: “Recalibrated”
  - Forecasts are based on the most current EI available (e.g. 1997)
  - 1990 EI is reconstructed to provide a more accurate benchmark for measuring progress
    - Typical approach is to retain historical point source data and backcast area source categories
  - Growth assumptions are revised to reflect most recent information on the economy and demographics
  - Control levels are updated to reflect:
    - Rules adopted since the SIP
    - “Real-World” implementation of the “planned” measures yet to be adopted

“Recalibrated” SIP Tracking Scenarios



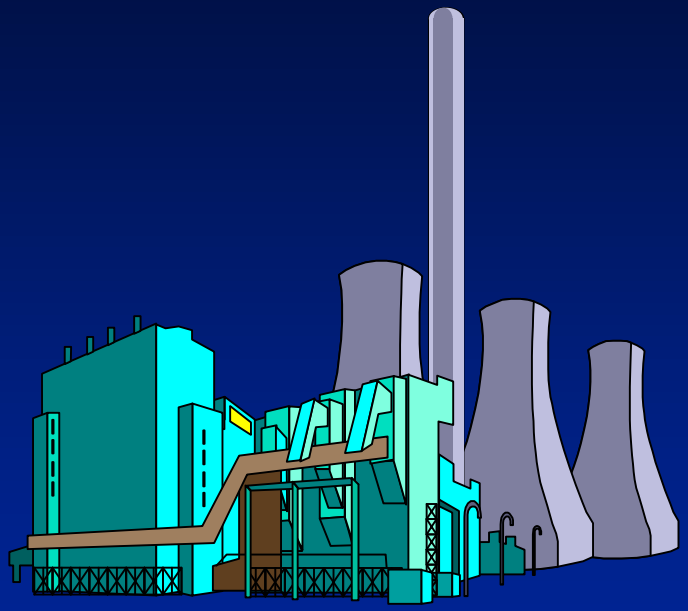
Reporting Parameters:
REGION
POLLUTANT
SOURCE_CAT
YEAR

*** The 1990 inventory is reconstructed to account for methodology improvements.**

Rule Tracking (RT) Component

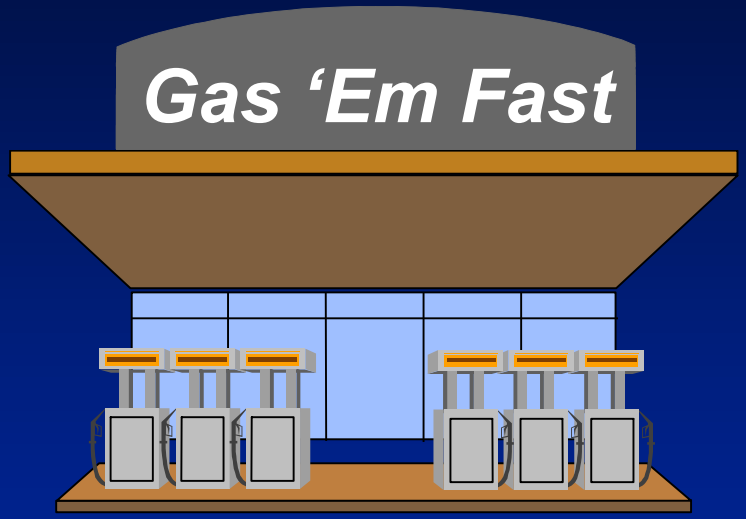
- Brings inventory and rule efforts together
- CEFS does not support control category level information (all control data must be rule-source specific)
- ARB to develop RT data for state and federal sectors
- Districts to develop RT data for local sectors
- A few districts have submitted comprehensive RT data sets
- “Adopted” and “Planned” measures to be supported
  - More later in the Control Profile Development session

Tracking Levels: Stationary Sources



Point

(SCC or SCC/SIC LEVEL)

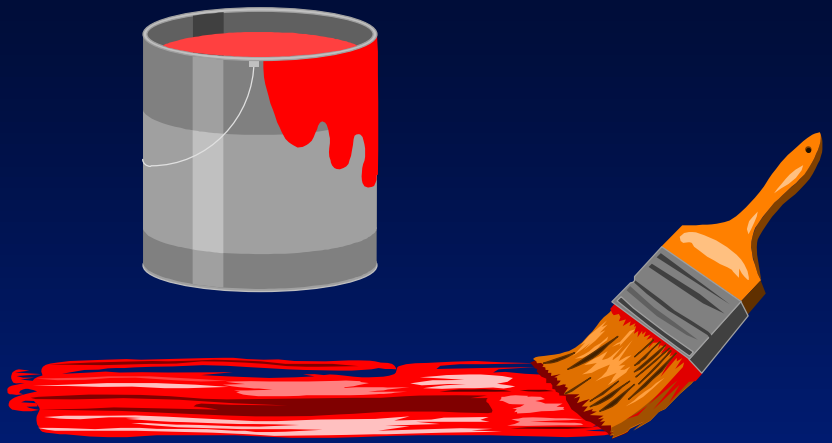


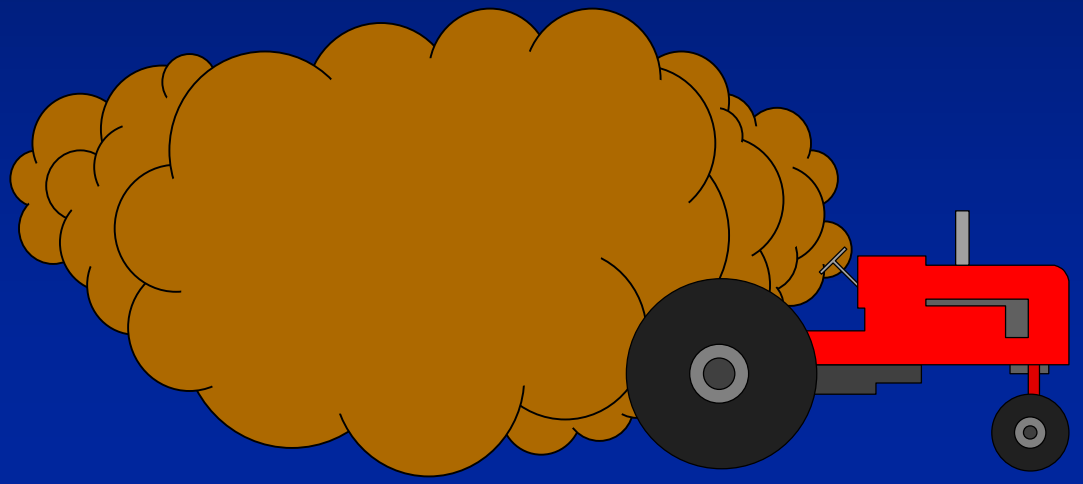
Aggregated Point

(EIC LEVEL)

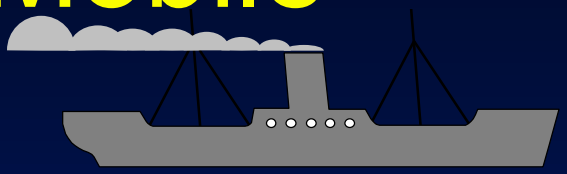
Tracking Levels: Area-Wide

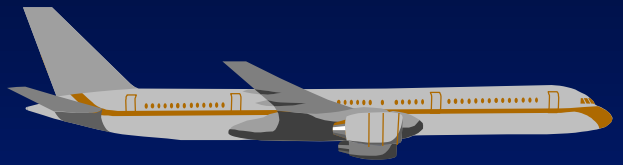
(EIC LEVEL)

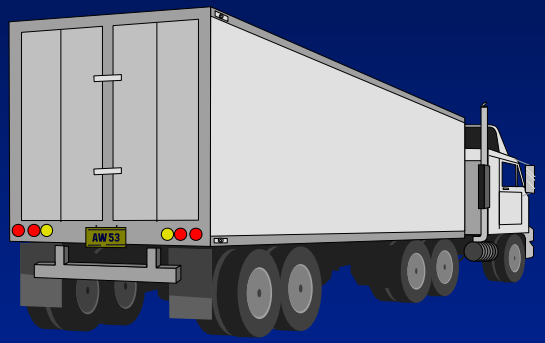




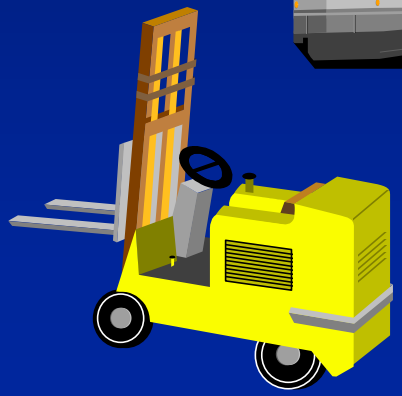
Tracking Levels: Mobile







Other Mobile (Evaluated with the OFFROAD model)



On-Road (Evaluated with the EMFAC model)

Facility/Process Specific Analysis (CEFS/GIS Program)

Need for Process Specific Emissions

- To Develop Gridded Inventories for Input to Photochemical Models
- Support Special Studies such as Trend Analysis by Facility

Gridded (Modeling) Inventories

- Are Spatially and Temporally Resolved
- Have Emissions Located within Grid Cells (typically 2 kilometers square)
  - The region to be modeled is divided into uniform grid cells
- Contain Day/Hour-Specific Emissions
  - Emissions approximate episode being modeled (for example: the 24 hours in an August weekday in 1997)

Gridded (Modeling) Inventories

- How are Emissions Spatially Allocated?
  - **Point Sources**: Emission process locations are identified in the inventory by UTM coordinates stored in CEIDARS
  - **Area and Off-Road Mobile Sources**: Region-level emissions are further resolved by assigning spatial surrogates (e.g. population, land use segments, housing units, etc.)

Gridded (Modeling) Inventories

- How are Emissions Spatially Allocated?
  - **On-Road Mobile Sources**:
    - Running exhaust emissions are distributed by roadway links within each grid cell
    - Trip emissions are assigned to the centroid of each traffic zone--the position of the centroid determines the grid cell assignment

Gridded (Modeling) Inventories

- How are Emissions Temporally Allocated?
  - Two Methods are available
  - Method used is determined by the availability of day and hour-specific data
  - Data are stored in the Temporal Module in CEFS

Day/Hour Specific Data Not Available

$$DEMS = \frac{EMS}{365} * \frac{MT}{(1/12)} * \frac{DF}{(1/7)} * 907.18474$$

Where:

DEMS = Emissions of a particular day of the month (kg/day)

EMS = Annual Emissions (tons/year

MT (Monthly Throughput) = Monthly activity fraction

$$= \frac{\text{Operating days per month}}{\text{Operating days for all twelve months}}$$

DF (Day Factor) = decoded weekly operating cycle (DPWK)

907.18474 = conversion factor (tons to kilograms)

Day/Hour Specific Data Not Available

$$HEMS = \frac{DEMS}{HOURS}$$

Where:

HEMS = Emissions per hour of the particular day (kg/hour)

DEMS = Emissions of a particular day of the month (kg/day)

HOURS = decoded daily operating cycle (HPDY)

Examples of Operating Cycle Codes:

For DPWK = 7, DAYFACTOR = 0.14286

For DPWK = 5, DAYFACTOR = 0.20000 for a weekday

DAYFACTOR = 0.00000 for a weekend day

For HPDY = 8, HOURS = 8 for hours 8 to 16 and HOURS = 0 for hours 1 to 7 and 17 to 24

Day/Hour Specific Data Are Available

DEMS = [EMS * MT / 4 * DAYFRAC] - DAYADJ

Where:

DEMS = Emissions of a particular day of the month (kg/day)

MT (Monthly Throughput) = Monthly activity fraction

or

$$= \frac{\text{Operating days per month}}{\text{Operating days for all twelve months}}$$

DAYFRAC = The fraction of weekly activity occurring on that day

DAYADJ = Factor to adjust for the actual number of days in the month

Day/Hour Specific Data Are Available

HEMS = DEMS * HOURFRAC

Where:

HEMS = Emissions per hour of the particular day (kg/hour)

DEMS = Emissions of the particular day of the month (kg/day)

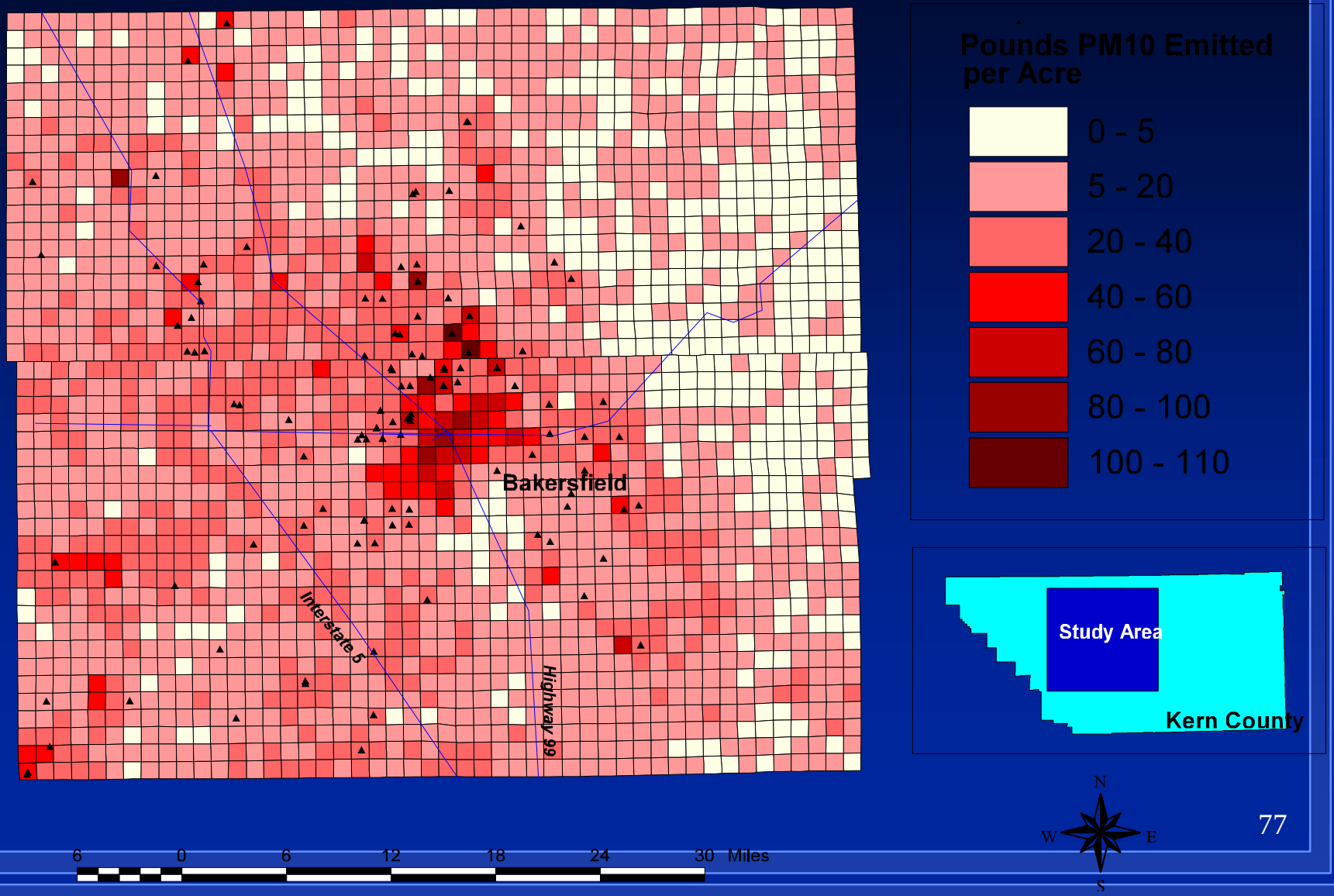
HOURFRAC = The fraction of daily activity occurring in that hour

CEFS/GIS Program Output

- Projected Day/Hour Specific Emissions
  - Point source emissions are by facility/device/process and include UTM coordinates and stack parameters
  - Area source emissions include spatial surrogate parameters (i.e. how emissions are distributed geographically)

Bakersfield (Kern County) Study Area

Combined PM10 Emissions from Agricultural Tilling, Point Sources and Road Dust



Input Data Set Construction

Input Data Set Construction

Part (1)
Growth Profile Development

Introduction

- Growth profile definition:

  "A growth profile describes how an assigned growth surrogate impacts an emission source category over time."

- CEFS will no longer support ARB's former growth category level information
- CEFS requires growth surrogates to be linked directly to an emission "category" in the inventory

Preliminaries

- Things to consider when constructing growth profiles
  - Remember that growth affects all pollutants equally
  - Define the emission categories that should be grown by a given surrogate
  - Determine if historical and projected data exist for the growth surrogate
  - Check if data exist at the desired geographical level of detail
  - Examine the relational links between the growth surrogate and inventory (i.e. EIC/SCC/SIC etc.)

Growth Data Relationships between CEFS Tables

- Parameter Assignment Data (PAD)
  - region_id
  - category_id
  - parameter
- Growth Activity Profile (GAP)
  - region_id
  - parameter
  - year
  - activity
- Forecast
  - district, air basin, county
  - EIC,SCC, SIC, CES
  - year
  - emissions
  - parameter
  - growth factor

PAD
Parameter Assignment Data

Growth Data Hierarchy

Region Selection:

1. District, Air Basin, County, Sub-County
2. District, Air Basin, County
3. Air Basin, County
4. County
5. Air Basin
6. District
7. California

Category Selection:

1. Facility, SCC, SIC
2. Facility
3. Facility, EIC
4. SCC, SIC
5. SCC6, SIC
6. SCC3, SIC
7. SCC
8. SIC
9. EIC, SIC
10. EIC
11. CES
12. SIC2
13. Facility, EIC, SIC

Note: Currently, options 1,2,3, and 13 are only available with GIS forecast module

ARB or the District has to define the growth parameter assignments

- ARB can define default growth parameter assignments
- If none assigned, the growth factor in the forecast table defaults to 1.0

Parameter Assignment

- Ideally consistent with process rate or emission generating activity
- Growth surrogate
  - logical or intuitive assignment
  - previous assignment
  - EPA and/or EIIP has guidelines for some, but not all, sources

Assignment of growth parameter - EI category links

- Stationary Point Sources
  - category_flag =4 (SIC,SCC)
  - category_flag= 7 (SCC)
  - category_flag=12 (SIC2)
- Area-wide and Aggregated Point Sources
  - category_flag= 9 (EIC,SIC)
  - category_flag=11 (CES)

Examples of Parameter - EI Category Links

- Electric Utilities - point source
  - by SIC (and SCC)
  - parameter='TOTAL_UTIL' or 'NONGAS_UTIL'
- Dry Cleaning - Aggregated point
  - by EIC parameter='POP-DOF'
- Tilling Dust - Area-wide
  - by EIC parameter = 'IRRIG-ACRES'

GAP
Growth Activity Profile

Growth data in the GAP table are measurements of the growth parameter

- Generally raw activity data
- Examples:
  - pop = people
  - mfg-totl = $ output in SIC 20-39
  - services-emp = # employed in SIC 70-89

Growth Profile over time

- Years 1975-2020
- If raw activity data only for years 1990 and 2010
  - Forecast program
    - interpolate year 1995 activity data
    - extrapolate years 1975 and 2020 activity data
  - ARB can attach related trend to district data

Sample Growth Profile Adjustment

- Consumer Aerosol Coatings EIC=510-500-9xxx-0000
  - Grown by POP-DOF, except
  - No growth assumption 1990-2020
  - parameter='POP-DOF-CPAP' (adjusted population)

Growth Data Input Notes

- Reference year must be included for all profiles in a region as described previously for control
- Cannot add overwrite data at the same region_id and category_id level
- Must delete data before new data can be added
- OR, new data must be at a higher priority level
- Look at the entire profile for a parameter, not

Growth Data Input Notes (cont)

- PAD parameter must be added before any related GAP profile can be added
- GAP data must be at the same region_id level as the PAD data
- Region_id has higher priority than category_id
- Use the comment field in the PAD and GAP tables to document data sources and assumptions

Improvements to Growth Data

- Pechan contract completed spring 2001
- CEC electric utility projections
- EIIP continuing work

Default growth parameters for mobile sources

parameters for aircraft, trains, ships, recrational vehicles can be overwritten

eic3	desc	act source	sample parm	notes
7xx	onroad mobile	EMFAC/BURDEN	DISTRICT (in forecast table)	fy ems are batch loaded
820	trains	MSD	TRN-HAUL-MSD TRN-SWIT-MSD	aagrawal 6-3-04 email stwd growth profile
810	aircraft	CSUF	FLT-CJET, FLT-CPIS, FLT-CTBP, FLT-MJET, FLT-MTBP	
830	ships & commercial boats	CSUF	EMP-SHIP, REG-CBTD, REG-CBTG	
850	recreational vehicles	CSUF	REG-ATV, REG-4WD	
840	recreational boats	MSD - offroad model	DISTRICT (in forecast table)	fy ems are batch loaded
860	offroad equipment (lawn & garden	MSD - offroad model	DISTRICT (in forecast table)	fy ems are batch loaded
870	farm equipment	MSD - offroad model	DISTRICT (in forecast table)	fy ems are batch loaded
890	gas cans	MSD - offroad model	DISTRICT (in forecast table)	fy ems are batch loaded

SQL> desc pad_data				
Name	**Null?**	**Type**	**description**	**notes**
REGION_ID	NOT NULL	VARCHAR2(14)	Region Number	
CATEGORY_ID	NOT NULL	VARCHAR2(40)	Category Number	
GROWTH_PARAM	NOT NULL	VARCHAR2(12)	Growth Parameter	
AGENCY_ASSIGNED		VARCHAR2(10)	Agency Assigned to a Parameter	
CAP_ON		VARCHAR2(1)	Maximum Growth Activity	not used
CAP_DESC		VARCHAR2(20)	Description of Maximum Limit	not used
CAP		NUMBER(6,3)	Maximum Growth Activity	not used
PARAM_COMMENT		VARCHAR2(60)	Comments of thie Parameter	
PARAM_SRC_DATE		DATE	Parameter Source Date	
OLD_GRO		VARCHAR2(3)	Old Growth Code	not used
USERID		VARCHAR2(8)	User ID	system generated
UPDATE_DATE		DATE	Update Date	system generated
SOURCE_DIS	NOT NULL	VARCHAR2(3)		system generated

SQL> desc gap_data				
Name	**Null?**	**Type**	**description**	**notes**
REGION_ID	NOT NULL	VARCHAR2(14)	Region Number	
GROWTH_PARAM	NOT NULL	VARCHAR2(12)	Growth Parameter	
YEAR	NOT NULL	NUMBER(4)	Year of Growth Activity	
GROACT	NOT NULL	NUMBER(15,3)	Growth Activity	
ACTIVITY_SOURCE		VARCHAR2(10)	Activity Source	
ACTIVITY_COMMENTS		VARCHAR2(60)	Comment on Activity	
ACTIVITY_SRC_DATE		DATE	Activity Source Date	
NONATTN		VARCHAR2(10)	Non Attainment Area Code	not used
USERID	NOT NULL	VARCHAR2(8)	User ID	system generated
UPDATE_DATE	NOT NULL	DATE	Update Date	system generated
SOURCE_DIS	NOT NULL	VARCHAR2(3)		system generated

PAD File Format for Batch Input

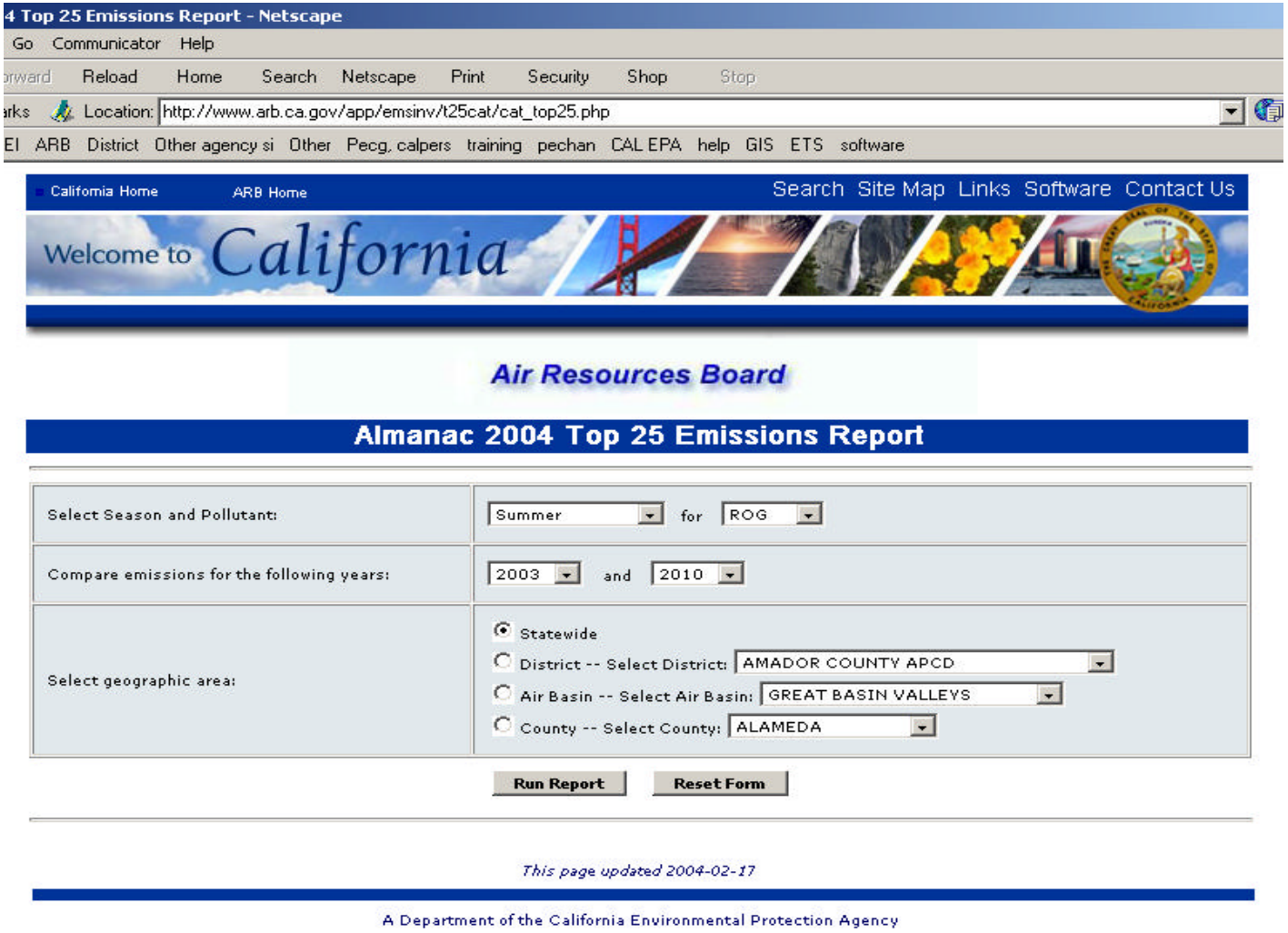
Field Name	Mandatory Field	Field Type	Field Length	Start Column	End Column	notes
REGION SELECTION FLAG	X	NUMERIC	1	1	1	
DISTRICT	if rflag=1,2,6	CHAR	3	3	5	
AIRBASIN	if rflag=1,2,3,5	CHAR	3	7	9	
COUNTY	if rflag=1,2,3,4	NUMERIC	2	11	12	
SUBCO	if rflag=1	CHAR	4	14	17	not used
GROWTH PARAM	X	CHAR	12	19	30	
AGENCY ASSIGNED		CHAR	10	32	41	
CATEGORY SELECTION FLAG	X	NUMERIC	2	43	44	
FACID	reserved for ARB use	NUMERIC	9	46	54	not used
SCC	if catflag=1,4,5,6,7	NUMERIC	14	56	69	
SIC	if catflag=1,4,5,6,8,9,12	NUMERIC	14	71	84	
EIC	if catflag=3,9,10	NUMERIC	14	86	99	
CES	if catflag=11	NUMERIC	6	101	106	
CAP_ON		CHAR	1	108	108	not used
CAP_DESC		CHAR	20	110	129	not used
CAP	if cap_on=Y	NUMERIC	7	131	137	not used
PARAMETER COMMENT	recommended use	CHAR	60	139	198	
PARAMETER SOURCE DATE	recommended use	DATE	8	200	207	MM/DD/YY
OLD GROWTH CODE		CHAR	3	209	211	not used
end of record marker	X	CHAR	1	215	215	period(.)

NOTE: FACID - is for GIS system only. Only ARB users are authorized to add facility specific data.

GAP File Format for Batch Input

Field Name	Mandatory Field	Field Type	Field Length	Start Column	End Column	notes
REGION SELECTION FLAG	X	NUMERIC	1	1	1	
DISTRICT	if rflag=1,2,6	CHAR	3	3	5	
AIRBASIN	if rflag=1,2,3,5	CHAR	3	7	9	
COUNTY	if rflag=1,2,3,4	NUMERIC	2	11	12	
SUBCO	if rflag=1	CHAR	4	14	17	not used
GROWTH PARAM	X	CHAR	12	19	30	
YEAR	X	CHAR	4	32	35	>=1970
GROWTH ACTIVITY	X	NUMERIC	15	37	51	>=0, <=99999999999.999
ACTIVITY SOURCE	recommended use	CHAR	10	53	62	
ACTIVITY COMMENT	recommended use	CHAR	60	64	123	
ACTIVITY SOURCE DATE	recommended use	DATE	8	125	132	MM/DD/YY
NA AREA		CHAR	10	134	143	not used
end of record marker	X	CHAR	1	145	145	period(.)

http://www.arb.ca.gov/app/emsinv/t25cat/cat_top25.php



ions Report - Netscape

Go Communicator Help

rward Reload Home Search Netscape Print Security Shop Stop

rks Location: http://www.arb.ca.gov/app/emsinv/t25cat/display.php

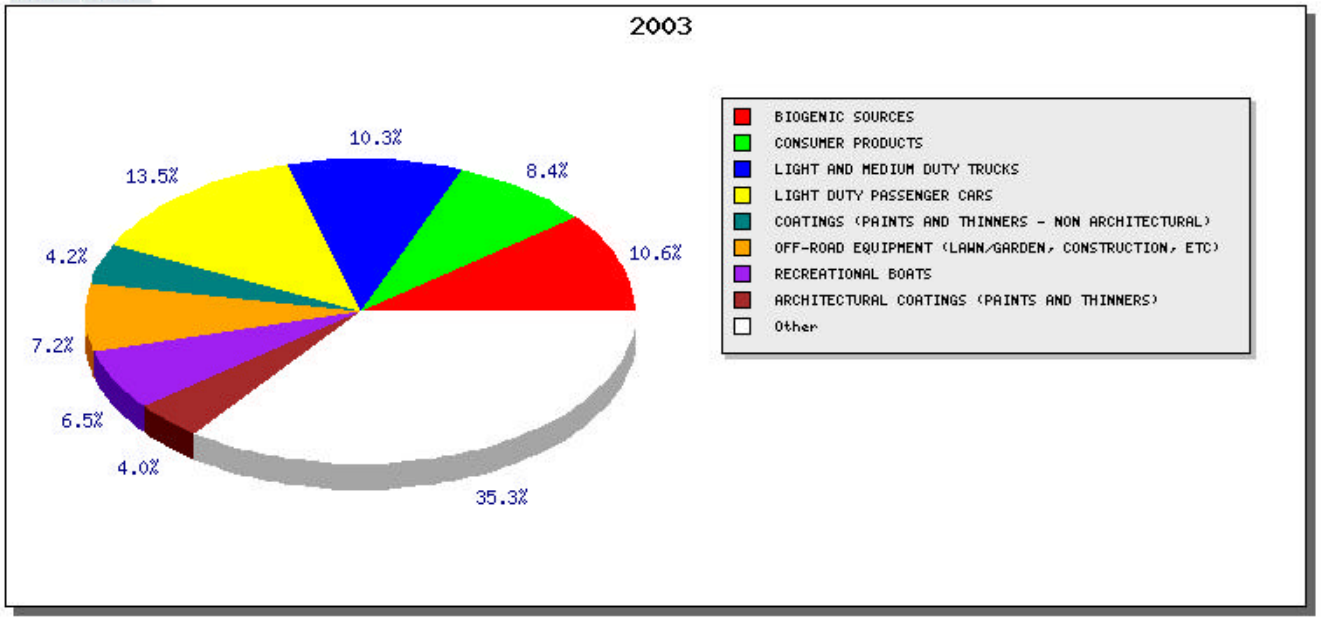
EI ARB District Other agency si Other Pecg, calpers training pechan CAL EPA help GIS ETS software

Air Resources Board

Top 25 Emissions Report

Statewide
Summer Top 25 For 2003 and 2010
Pollutant: ROG

2003 2010



Rankings		Summer	2003		2010	
2003	2010	Source Category	ROG (tpd)	% of Total	ROG (tpd)	% of Total
2	1	BIOGENIC SOURCES	317.37	10.6%	317.37	12.6%
4	2	CONSUMER PRODUCTS	253.09	8.4%	258.28	10.3%
3	3	LIGHT AND MEDIUM DUTY TRUCKS	308.95	10.3%	222.72	8.9%
1	4	LIGHT DUTY PASSENGER CARS	403.78	13.5%	219.61	8.7%
7	5	COATINGS (PAINTS AND THINNERS - NON ARCHITECTURAL)	126.29	4.2%	147.81	5.9%
5	6	OFF-ROAD EQUIPMENT (LAWN/GARDEN, CONSTRUCTION, ETC)	214.39	7.2%	138.69	5.5%
6	7	RECREATIONAL BOATS	193.75	6.5%	119.64	4.8%
8	8	ARCHITECTURAL COATINGS (PAINTS AND THINNERS)	121.39	4%	102.09	4.1%
9	9	PETROLEUM MARKETING (GASOLINE EVAPORATIVE LOSSES)	85.39	2.8%	84.11	3.3%
12	10	PRESCRIBED BURNING	61.47	2.1%	64.56	2.6%
11	11	PESTICIDES	69.75	2.3%	58.75	2.3%
15	12	LIVESTOCK WASTE (DAIRY CATTLE)	48.25	1.6%	55.85	2.2%
14	13	OIL AND GAS PRODUCTION (EVAPORATIVE LOSSES)	51.31	1.7%	49.18	2%
10	14	HEAVY DUTY GAS TRUCKS	70.48	2.4%	46.42	1.8%
17	15	ASPHALT PAVING / ROOFING	39.21	1.3%	40.52	1.6%
16	16	DEGREASING	45.58	1.5%	39.51	1.6%
18	17	AIRCRAFT	36.49	1.2%	38.46	1.5%
19	18	WILDFIRES	35.58	1.2%	35.59	1.4%
20	19	GEOGENIC SOURCES	29.48	1%	29.48	1.2%
22	20	LIVESTOCK WASTE (RANGE CATTLE)	27	0.9%	27	1.1%
13	21	GAS CANS	61.29	2%	25.52	1%
26	22	CHEMICAL (PROCESS AND STORAGE LOSSES)	20.72	0.7%	23.95	1%
25	23	FOOD AND AGRICULTURE (CROP PROCESSING AND WINERIES)	21.41	0.7%	23.18	0.9%
21	24	HEAVY DUTY DIESEL TRUCKS	27.82	0.9%	23.05	0.9%
24	25	PETROLEUM REFINING (EVAPORATIVE LOSSES)	21.61	0.7%	22.58	0.9%

[Download Data]

district growth parameter review of top 25 categories yr2010.xls

FYEAR	DIS	AB	CO	SIC	SCC	XEIC	XEIC SUM	GROWTH_PARAM	SCENARIO	T25 CAT	T25CATN	ECONSE	ROG_SUM EMS	NOX_SUM EMS	CO_SUM EMS	GF2010
2010	AMA	MC	3	9223	20300204	020-040-0110-0000	20	SIC_91-97C5	TND03_OTHR_SP	10	COGENERATION	I	0.0002	0.0200	0.0028	1.020
2010	AMA	MC	3	9223	20200104	020-040-1200-0000	20	SIC_91-97out	TND03_OTHR_SP	10	COGENERATION	I	0.0000	0.0013	0.0004	1.152
2010	AMA	MC	3	9223	20100102	030-040-1200-0000	30	SIC_91-97out	TND03_OTHR_SP	52	OIL AND GAS PRO	P	0.0000	0.0000	0.0000	1.152
2010	AMA	MC	3	1422	20200102	050-040-1200-0000	50	SIC_14-I31	TND03_OTHR_SP	45	MANUFACTURING	I	0.0004	0.0041	0.0009	1.154
2010	AMA	MC	3	1446	39000699	050-070-0110-0000	50	SIC_14-I35	TND03_OTHR_SP	45	MANUFACTURING	I	0.0018	0.0273	0.0062	1.077
2010	AMA	MC	3	2431	39000699	050-070-0110-0000	50	SIC_243-out	TND03_OTHR_SP	45	MANUFACTURING	I	0.0000	0.0003	0.0001	1.000
2010	AMA	MC	3	2493	39000689	050-070-0110-0000	50	SIC_244&9out	TND03_OTHR_SP	45	MANUFACTURING	I	0.0003	0.0154	0.0046	1.148
2010	AMA	MC	3	2493	39000699	050-070-0110-0000	50	SIC_244&9out	TND03_OTHR_SP	45	MANUFACTURING	I	0.0003	0.0144	0.0036	1.148
2010	AMA	MC	3	3255	39000699	050-070-0110-0000	50	SIC_325+-I35	TND03_OTHR_SP	45	MANUFACTURING	I	0.0011	0.0260	0.0064	1.167
2010	AMA	MC	3	2493	39000589	050-070-1220-0000	50	SIC_244&9out	TND03_OTHR_SP	45	MANUFACTURING	I	0.0000	0.0006	0.0002	1.148
2010	AMA	MC	3	#####	########	050-995-0110-0000	50	CATEGORY29	TND03_OTHR_SAA	45	MANUFACTURING	I	0.0056	1.4998	0.3193	1.100
2010	AMA	MC	3	#####	########	050-995-1500-0000	50	CATEGORY30	TND03_OTHR_SAA	45	MANUFACTURING	I	0.0018	0.0989	0.0086	1.124
2010	AMA	MC	3	9223	10300602	060-005-0110-0000	60	SIC_91-97C5	TND03_OTHR_SP	70	SERVICE AND CO	I	0.0006	0.0048	0.0120	1.020
2010	AMA	MC	3	9223	10300603	060-005-0110-0000	60	SIC_91-97C5	TND03_OTHR_SP	70	SERVICE AND CO	I	0.0009	0.0230	0.0056	1.020
2010	AMA	MC	3	9223	10300501	060-005-1220-0000	60	SIC_91-97C2	TND03_OTHR_SP	70	SERVICE AND CO	I	0.0000	0.0000	0.0000	0.892
2010	AMA	MC	3	#####	########	060-020-0110-0000	60	CATEGORY33	TND03_OTHR_SAA	70	SERVICE AND CO	I	0.0001	0.0087	0.0014	1.025
2010	AMA	MC	3	9223	20300101	060-040-1200-0000	60	SIC_91-97C2	TND03_OTHR_SP	70	SERVICE AND CO	I	0.0000	0.0010	0.0003	0.892
2010	AMA	MC	3	#####	########	060-995-0110-0000	60	CATEGORY33	TND03_OTHR_SAA	70	SERVICE AND CO	I	0.0018	0.0647	0.0079	1.025
2010	AMA	MC	3	#####	########	099-040-1200-0000	99		ALM03_OFF_IC	55	OTHER (FUEL CO	I	0.0012	0.0114	0.0035	1.000
2010	AMA	MC	3	9223	50200101	130-130-0240-0000	130	SIC_91-97out	TND03_OTHR_SP	29	INCINERATORS	I	0.0000	0.0000	0.0000	1.152
2010	AMA	MC	3	#####	########	199-995-0260-0000	199	POP-DOF	TND03_OTHR_SAA	59	OTHER (WASTE D	I	0.0047	0.0000	0.0000	1.070
2010	AMA	MC	3	7216	40100103	210-200-3300-0000	210	SIC_721&5out	TND03_OTHR_SP	31	LAUNDERING	C	0.0000	0.0000	0.0000	1.000
2010	AMA	MC	3	#####	########	210-200-3300-0000	210	POP-DOF	TND03_OTHR_SAA	31	LAUNDERING	C	0.0000	0.0000	0.0000	1.070
2010	AMA	MC	3	#####	########	210-200-8102-0000	210	POP-DOF	TND03_OTHR_SAA	31	LAUNDERING	C	0.0000	0.0000	0.0000	1.070
2010	AMA	MC	3	#####	########	210-200-8150-0000	210	POP-DOF	TND03_OTHR_SAA	31	LAUNDERING	C	0.0015	0.0000	0.0000	1.070
2010	AMA	MC	3	#####	########	220-204-0500-0000	220	CATEGORY36	TND03_OTHR_SAA	14	DEGREASING	I	0.0703	0.0000	0.0000	0.910
2010	AMA	MC	3	#####	########	220-204-3022-0000	220	SIC_20-39out	TND03_OTHR_SAA	14	DEGREASING	I	0.0013	0.0000	0.0000	1.223
2010	AMA	MC	3	#####	########	220-204-3083-0000	220	SIC_20-39out	TND03_OTHR_SAA	14	DEGREASING	I	0.0001	0.0000	0.0000	1.223
2010	AMA	MC	3	#####	########	220-204-3204-0000	220	SIC_20-39out	TND03_OTHR_SAA	14	DEGREASING	I	0.0000	0.0000	0.0000	1.223

FYEAR	2010						
DIS	(All)						
AB	(All)						
CO	(All)						
		Data					
T25CAT	T25CATN	ROG summer ems	NOX summer ems	CO summer ems	ROG %	NOX %	CO %
1	ADHESIVES AND SEALANTS	20.31	0.00	0.00	0.8%	0.0%	0.0%
2	AG BURNING	15.83	3.27	180.30	0.6%	0.1%	1.6%
3	AGRICULTURAL IRRIGATION	4.40	37.84	14.73	0.2%	1.5%	0.1%
4	AIRCRAFT	38.46	64.03	290.56	1.5%	2.5%	2.6%
5	ARCHITECTURAL COATINGS	102.08	0.00	0.00	4.1%	0.0%	0.0%
6	ASPHALT PAVING / ROOFING	40.52	0.00	0.00	1.6%	0.0%	0.0%
7	BIOGENIC SOURCES	317.37	0.00	0.00	12.6%	0.0%	0.0%
8	CHEMICAL (PROCESS AND S	23.95	1.90	0.74	1.0%	0.1%	0.0%
9	COATINGS (PAINTS AND THI	147.81	0.23	0.23	5.9%	0.0%	0.0%
10	COGENERATION (ELECTRICI	9.15	29.46	52.32	0.4%	1.1%	0.5%
12	CONSUMER PRODUCTS	258.26	0.00	0.00	10.3%	0.0%	0.0%
13	COOKING	6.23	0.00	0.00	0.2%	0.0%	0.0%
14	DEGREASING	39.51	0.00	0.00	1.6%	0.0%	0.0%
15	ELECTRIC UTILITIES	5.06	53.70	70.06	0.2%	2.1%	0.6%
16	ELECTRONICS	0.81	0.02	0.01	0.0%	0.0%	0.0%
17	FARM EQUIPMENT (TRACTOI	16.54	120.34	136.03	0.7%	4.7%	1.2%
19	FIRES	0.74	0.25	10.46	0.0%	0.0%	0.1%
20	FOOD AND AGRICULTURAL F	0.41	4.01	7.07	0.0%	0.2%	0.1%
21	FOOD AND AGRICULTURE (C	23.18	9.11	2.50	0.9%	0.4%	0.0%
23	GAS CANS	25.52	0.00	0.00	1.0%	0.0%	0.0%
24	GEOGENIC SOURCES	29.48	0.00	0.00	1.2%	0.0%	0.0%
25	GLASS AND RELATED PRODU	0.43	11.34	0.31	0.0%	0.4%	0.0%
26	HEAVY DUTY DIESEL TRUCK	23.04	511.46	108.00	0.9%	19.8%	1.0%

FYEAR	2010		currently sorted by decr rog						
DIS	(All)		to sort by decr nox, make f15 active cell, click sort z->a						
AB	(All)		to sort by decr co, make g15 active cell, click sort z->a						
CO	(All)								
SIC	(All)		note: growth parameter=DISTRICT indicates scenario like 'EMFAC', 'OFFROAD', or 'RECLAIM'						
SCC	(All)								
XEICSUM	(All)		caution: max gf. check each dis, ab, co						
XEIC	(All)								
T25CAT	(All)		caution: remember to cross check against pad_table to see where else parameter might be assigned						
T25CATN	(All)								
ECONSECT	(All)								
	Data								

GROWTH_PARAM	Count of FYEAR	Count of GROWTH_ PARAM	Max of GF2010	ROG SUMEMS	NOX SUMEMS	CO SUMEMS	ROG %	NOX %	CO %
DISTRICT	16040	16040	1.000	755.20	1629.51	7200.64	30.06%	63.19%	65.23%
NOGROWTH	68	68	1.000	209.96	21.47	119.04	8.36%	0.83%	1.08%
(blank)	1599		1.000	115.24	119.83	788.16	4.59%	4.65%	7.14%
NO_GROWTH	181	181	1.000	111.73	14.86	845.02	4.45%	0.58%	7.65%
POP-SCAG	984	984	1.367	110.77	1.22	9.21	4.41%	0.05%	0.08%
POP-DOF	5089	5089	1.343	83.14	1.51	6.83	3.31%	0.06%	0.06%
NO_GROWTH_1	8	8	1.000	82.70	5.61	213.52	3.29%	0.22%	1.93%
IRRIG-ACRES	256	256	1.067	73.05	43.06	192.60	2.91%	1.67%	1.74%
DAIRY	60	60	1.212	55.85	0.00	0.00	2.22%	0.00%	0.00%
DUR_MFG-out	50	50	2.000	52.30	0.01	0.00	2.08%	0.00%	0.00%
ba160-Popula	1071	1071	1.057	44.41	0.00	0.00	1.77%	0.00%	0.00%
SIC_15-17emp	246	246	1.214	37.82	0.00	0.00	1.51%	0.00%	0.00%
HOUSINGUNITS	2468	2468	1.172	36.37	0.07	3.07	1.45%	0.00%	0.03%
GAS&OIL-exp	492	492	1.176	33.93	0.00	0.00	1.35%	0.00%	0.00%
CATEGORY05	103	103	1.000	31.39	10.27	5.72	1.25%	0.40%	0.05%
HU-SCAG	414	414	1.196	30.67	5.77	14.41	1.22%	0.22%	0.13%
RANGE	62	62	1.000	27.00	0.00	0.00	1.07%	0.00%	0.00%
CATEGORY45	37	37	1.014	25.03	0.00	240.44	1.00%	0.00%	2.18%
SIC_20-39out	917	917	1.500	24.26	0.01	0.44	0.97%	0.00%	0.00%
MFG-TOTL	208	208	1.539	22.69	0.49	0.20	0.90%	0.02%	0.00%

sb - gap top 30 data.csv

REGION_FLAG	DIS	AB	CO	SUBCO	GROWTH_PARAM	YEAR	GROACT	ACTIVITY_SOURCE	ACTIVITY_COMMENTS	ACTIVITY_SRC_DA	NONATTN	'.'	USERID	UPDATE_DATE	SOURCE_DIS
3		SCC	42		POP-DOF-CPAP	1970	265800	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1971	269800	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1972	271200	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1973	274800	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1974	279600	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1975	281100	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1976	288900	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1977	290600	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1978	293300	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1979	295700	DOF	DOF I70-80			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1980	300000	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1981	306100	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1982	313500	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1983	322800	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1984	329200	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1985	338200	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1986	345100	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1987	351200	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1988	354600	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1989	364700	DOF	DOF I80-90			.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1990	369000	DOF/ARB	DOF E-2 released Jan 2002	30-Jan-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1991	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1992	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1993	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1994	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1995	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1996	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1997	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1998	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	1999	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	2000	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	2001	369000	DOF/ARB	SSD 7-5-01 memo nogrowth post 1990	10-Jun-02		.	ARLERCH	10-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	2002	369000					.	CEFS_I	28-Jun-02	ARB
3		SCC	42		POP-DOF-CPAP	2003	369000					.	CEFS_I	28-Jun-02	ARB

Part (2)
Control Profile Development

Introduction

- Control profile definition:

  "A control profile describes how a regulatory action, proposed control strategy or a technological change impacts an emission source category over time."

- CEFS will no longer support ARB's former control category level control information
- CEFS requires emission control rules to be linked directly to the emission processes in the inventory
- Rule 1 in the science of control profile development = it is as much art as science

Preliminaries

- Things to consider when constructing control profiles
  - What categories are targeted in the rule?
  - Relational links between the rule and inventory (i.e. EIC/SCC/SIC etc.)
  - What is the behavior of the rule (i.e. is it implemented in a **STEP** or **LINEAR** fashion or a COMBINATION of the two)?
  - Does the rule penetrate the entire emission category(s) or is it less than 100%?
  - How will Rule Effectiveness be treated?
  - Are there other rules that hit the category?

Preliminaries
(continued)

- What calendar year inventory is used to map rule to the source categories impacted?
  - Emission inventory process identification can change from year to year
  - Knowledge of the inventory and applicable rules / source connections are critical for successful forecasting
  - A switch in base year EI can cause control factors to be missed if not properly mapped

Assignment of Rule-EI Category Links

- CEIDARS and CEFS use the EIC/SCC/SIC coding system to manage the emissions and control data -- all 14 digit fields
- EIC codes often have a mixture of point and area source categories
- For an EIC that contains a mixture, the areawide portion is identified by EIC/SCC/SIC fields all containing the same 14 digit EIC code

Assignment of Rule-EI Category Links

- The point source processes which are contained in the same EIC category are identified by the 8-digit SCC code filled in the SCC field, and the 4 digit SIC code filled in the SIC field

Assignment of Rule-EI Category Links

- Example of Solvent EIC containing a mixture of point and area source emissions

Vapor Degreasing
EIC: 220,206,8106,0000

Areawide Portion

EIC	SCC	SIC
220,206,8106,0000	220,206,8106,0000	220,206,8106,0000

Assignment of Rule-EI Category Links

Point Source Process (there could be many others)

SCC: 40100398 (Cold Cleaning)
SIC: 3479 (Fabricated Metal Products)

EIC	SCC	SIC
220,206,8106,0000	40100398	3479

Growth and Control Data Hierarchy

Region Selection:

1. District, Air Basin, County, Sub-County
2. District, Air Basin, County
3. Air Basin, County
4. County
5. Air Basin
6. District
7. California

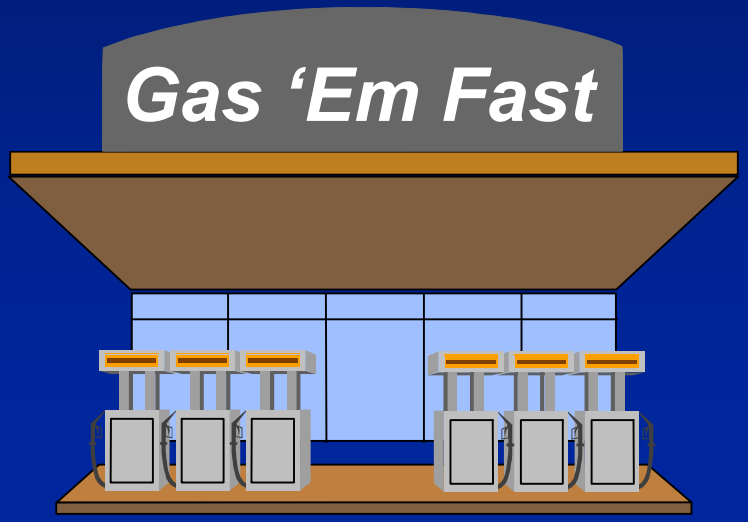
Category Selection:

1. Facility, SCC, SIC
2. Facility
3. Facility, EIC
4. SCC, SIC
5. SCC6, SIC
6. SCC3, SIC
7. SCC
8. SIC
9. EIC, SIC
10. EIC
11. CES
12. SIC2
13. Facility, EIC, SIC

Note: Currently, options 1,2,3, and 13 are only available with GIS forecast module

Assignment of Rule-EI Category Links

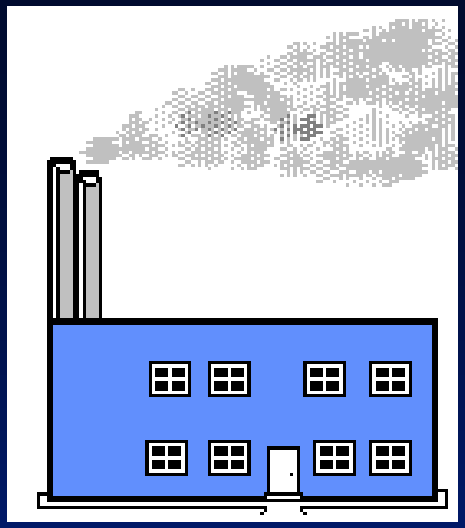
- Rules that affect categories that are **purely areawide** such as architectural coatings, or **stationary aggregated** such as gas stations, should be assigned controls at the EIC level (CATFLAG 10).



Assignment of Rule-EI Category Links

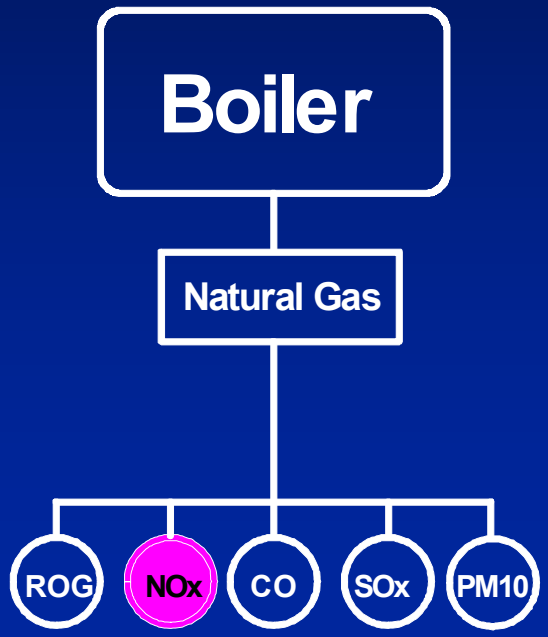
- Rules that affect categories that are **purely point** sources, assign control at the SCC level (CATFLAG 7) and/or SCC/SIC level (CATFLAG 4)

  (Note: If the rule affects certain industries uniquely, SCC/SIC level data can be layered within the SCC level data)



Point Source Control Layering

Rule X places NOx limits on natural gas fired boilers and heaters > 100 MMBTU/HR (SCC: 10300601)



SCC	SIC
10300601	3678 (Electronics)
	4961 (Steam Supply)
	8062 (Medical Services)
	8211 (Elementary Schools)
	8221 (Universities)
	9711 (National Security)

- Category Selection "Option 7" used if rule applies to the entire universe of SCC: 10300601.
- Category Selection "Option 4" used if the rule targets a particular industry sector more or less stringently than the other industries.

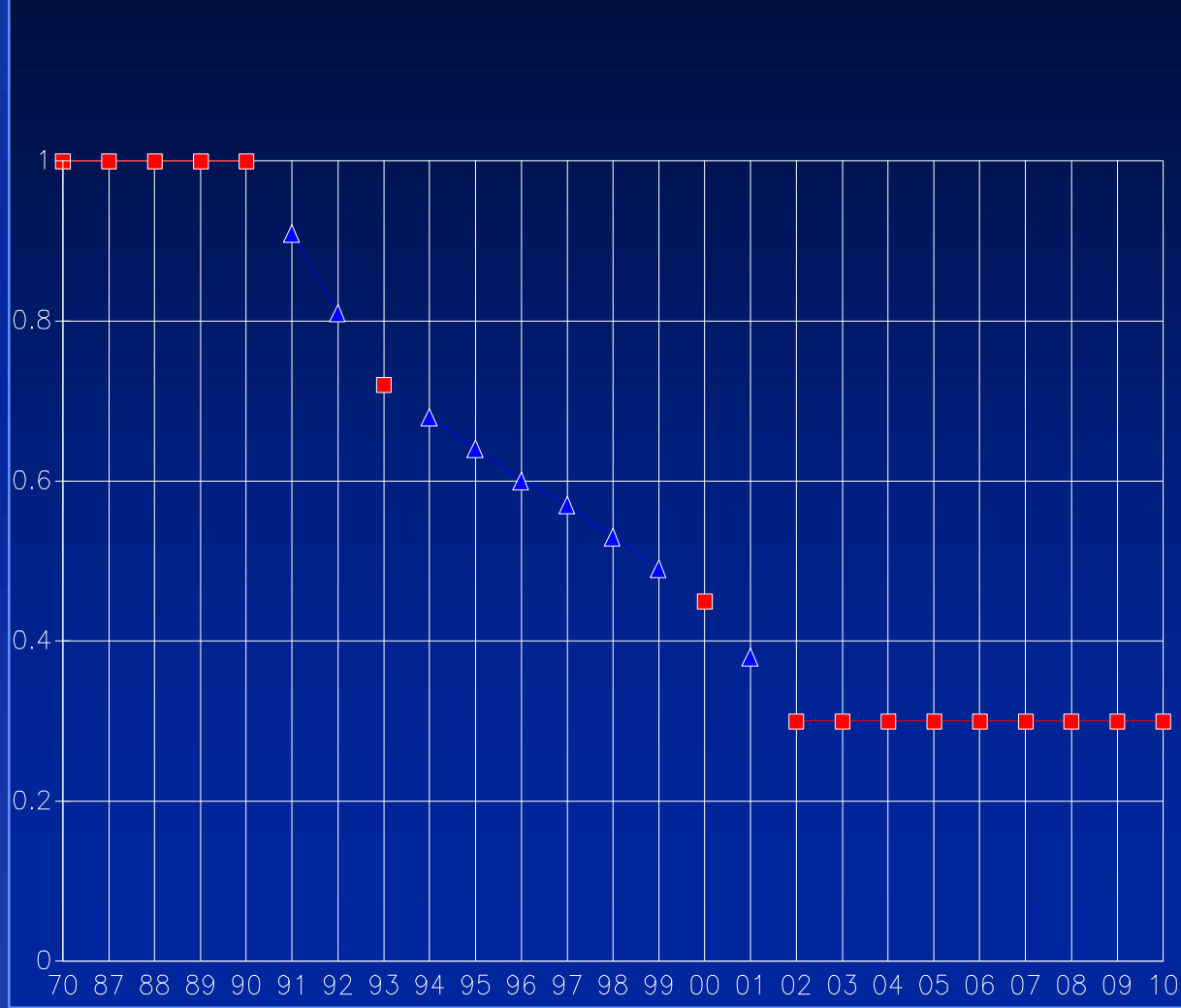
Assignment of Rule-EI Category Links

- In cases like solvents, where there is a **mix of point and area sources** within an EIC, control rules can be linked to the categories in **"Layers"** but be careful!
  - Rule X can be assigned to specific point source processes by SCC (CATFLAG 7) or SCC/SIC (CATFLAG 4) combinations within an EIC
  - Then Rule X can be assigned to the EIC level (CATFLAG 10) to capture the balance of the SCC/SIC combinations within this EIC as well as the areawide portion

Development of Control Profiles

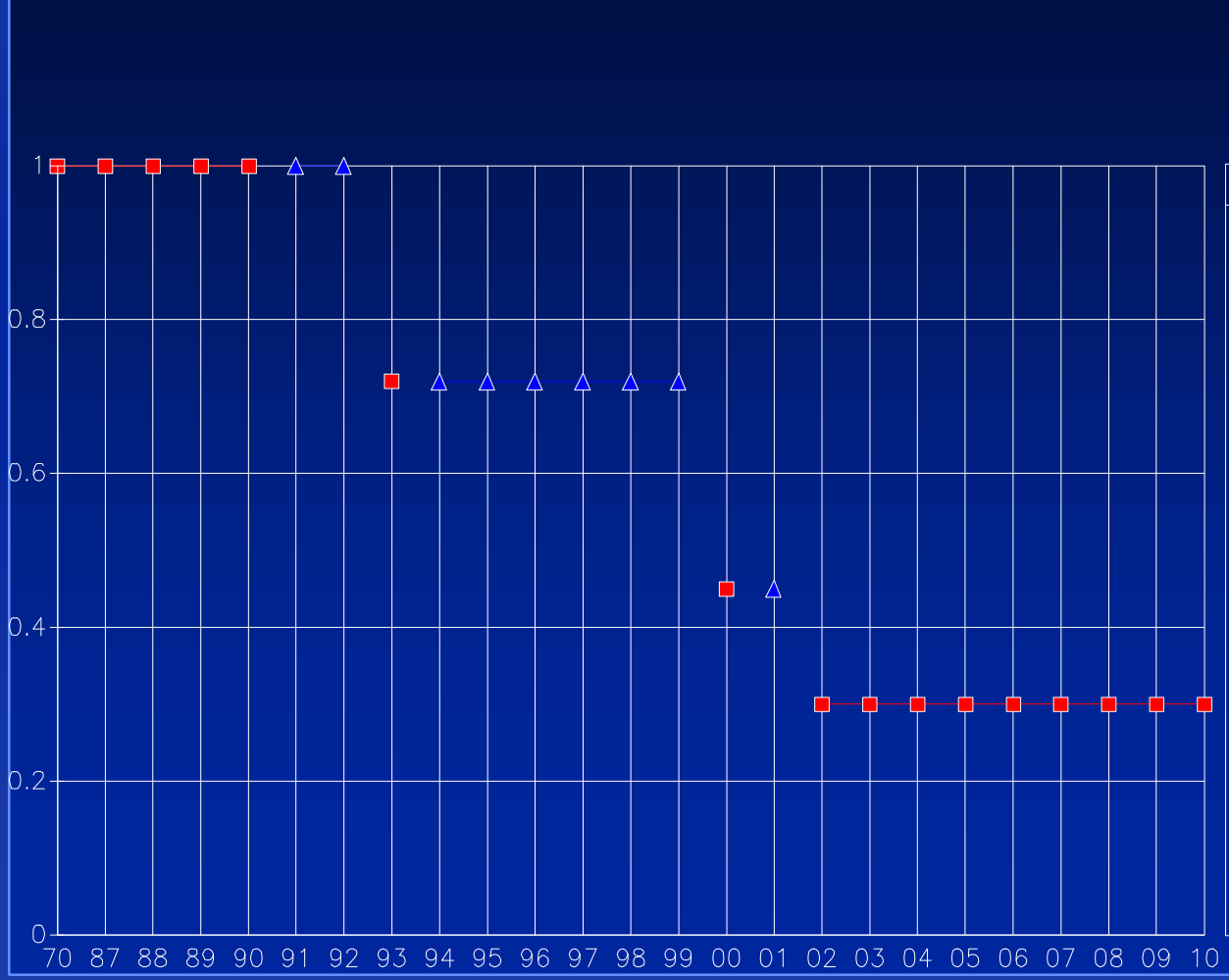
- Choosing a **reference year** for the control rule data set
  - CEFS performs global interpolation of all the control data for a given agency in a single pre-process step and inserts interpolated values into the data table. Each control rule profile must include a common reference year (e.g. 1990) in its profile for CEFS to do its job right. This choice of reference year is arbitrary and is the choice of the responsible agency

Sample Control Profile w/ Linear Interpolation



	Raw Data	Interpolated
70	1	
87	1	
88	1	
89	1	
90	1	
91		.91
92		.81
93	.72	
94		.68
95		.64
96		.60
97		.57
98		.53
99		.49
00	.45	
01		.38
02	.3	
03	.3	
04	.3	
05	.3	
06	.3	
07	.3	
08	.3	
09	.3	
10	.3	

Sample Control Profile w/ Step Interpolation



	Raw Data	Interpolated
70	1	
87	1	
88	1	
89	1	
90	1	
91		1
92		1
93	.72	
94		.72
95		.72
96		.72
97		.72
98		.72
99		.72
00	.45	
01		.45
02	.3	
03	.3	
04	.3	
05	.3	
06	.3	
07	.3	
08	.3	
09	.3	
10	.3	

Development of Control Profiles

1. Determine the Control Efficiency (CE)
   - Generally falls right out of the rule requirements
   - In simple terms...

     CE = Post-controlled Emission Rate / Pre-controlled Emission Rate
     - pounds of NOx per million BTU heat input
     - grams of VOC per liter of product
     - pounds of NOx per brake horsepower-hour
     - etc.

Development of Control Profiles
(continued)

2. Determine the Rule Penetration (RP) (sometimes referred to as Impact Factor; Default=1.0)
   - RP factor is handy for ...
     - Apportioning control to categories that are only partially regulated by a rule (i.e. accounting for sources that are either exempt or already compliant)
     - Describing the phase-in characteristics of the rule

Development of Control Profiles
(continued)

3. Determine the Rule Effectiveness (RE) factor (Default = 1.0)
   - RE factor is used to adjust for "Real-World" operating conditions
   - EPA has given guidance for the use of 80% as default
   - Most agree that a blanket 80% default is not advised because this can lead to overprojected emissions
   - RE factors should be based on category specific compliance studies if possible

Development of Control Profiles
(continued)

4. Calculate the control profile

$CL = 1 - \{(1-CE) * RP * RE\}_{(r,m,s,p,y)}$

where:

CL = Control Level

CE = Control Efficiency

RP = Rule Penetration

RE = Rule Effectiveness

r = region

m = the measure

s = source category

p = pollutant

y = year

Control Data Relationships In CEFS

- Rule Description Table
  - Agency *
  - Rule Number *
  - Rule Title
  - Other general rule info
- Region Type Table
  - Region ID *
  - Region Flag *
  - District
  - Air Basin
  - County
- Control Data Table
  - Agency *
  - Rule Number *
  - Region ID *
  - Category ID *
  - Pollutant
  - All control profile info
- Category Type Table
  - Category ID *
  - Category Flag *
  - SCC
  - SIC
  - EIC

* Key Fields

Control Data Notes

- Cannot add overwrite data at the same region_id and category_id level
- Must delete data before new data can be added
- OR, new data must be at a higher priority level
- Look at the entire profile for a rule, not just a single year

The Approach

- Phase I: Conduct a "comprehensive" study to develop control rule data set for ***adopted*** local rules (***Post-1990 Implementation at a minimum--go back to 1975 if possible***)
- Electronic data exchange approach
- Replaces ARB's Rule Tracking (RT) form system for control inputs to CEFS

Problems with RT Form for Forecasting

- Form submittals began in 1993, therefore, control profiles don't represent a comprehensive data set needed for forecasting
- Forms have not been used properly in many cases (e.g. growth often included)
- Control data sets can become far too massive to rely on paper data submittal alone

Future Role of RT Form

- Future role of the forms will be limited to a cross-check for newly adopted rules which are submitted for SIP completeness but will not be the official data record for forecasting
- The RT form does not utilize RP and RE factors. If the effects of RP and RE are lumped with the CE factor, then the basic tenets of the RT form instructions still apply

Helps

- Existing control data by ARB control categories are mapped in CEFS to SCC/SIC/EIC in CEFS
  - This data set represents the prior control assumptions (responsible agencies are “COMBINED”)
  - These data are **outdated** and should be used only as a limited reference
  - Control levels which can not be associated with a rule or technology change should be removed from the data set

Helps
(continued)

- Guidance document for CEFS Rule Tracking System Data Set Construction
  - Note: Although CEFS has rigid data transaction formats, data can be submitted in much simpler formats
- Limited control rule data submitted to ARB to date
- SCC Manual
- SIC Manual
- EIC/CES List

Input Data Set Construction

Part (3)
Temporal Profile Development

Introduction

- Temporal profile definition:

"A temporal profile describes how the activity of an emission source or source category changes with time within the base calendar year."

- A Temporal Profile can Express the Source Activity Occurring during a Season, Month, Day, or Hour

Match Temporal Resolution to Program Needs

Purpose	Temporal Resolution
Planning Inventory	Seasonal
Modeling Inventory	Hourly for a Weekday in August
Weekday/Weekend Studies	Daily

Storing Temporal Data

- CEIDARS PROCESS Tables
  - Year and process specific
  - Monthly activity fractions
  - Operating weeks per year
  - Code for operating days per week
  - Code for operating hours per day

Storing Temporal Data

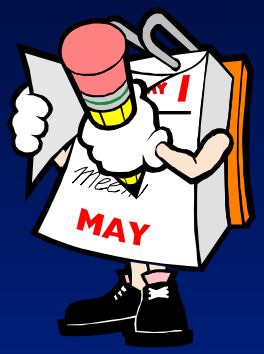
- CEFS MONTH Table
  - Process specific
  - Monthly activity fractions
  - Actual operating days per month
  - Code for operating days per week
  - Code for operating hours per day

Storing Temporal Data

- CEFS CATMONTH Table
  - Category specific by EIC code
  - Monthly activity fractions
  - Actual operating days per month
  - Code for operating days per week
  - Code for operating hours per day

Storing Temporal Data

- CEFS CATDAY Table
  - Category specific by EIC code
  - Month specific
  - Daily activity fractions
- CEFS CATHOUR Table
  - Category specific by EIC code
  - Month specific
  - Day Specific
  - Hourly activity fractions



Sources of Temporal Data

- CEIDARS PROCESS Tables
  - Districts provide data for all point sources and some area sources
  - ARB provides data for rest of area sources (including on-road and off-road mobile)

Sources of Temporal Data

- CEFS MONTH Table
  - Populated from CEIDARS process table
  - Can be updated with data from districts, special studies, and other sources
- CEFS CATMONTH Table
  - Area source category data from CEIDARS
  - Other EIC category data from CEIDARS, special studies, and other sources

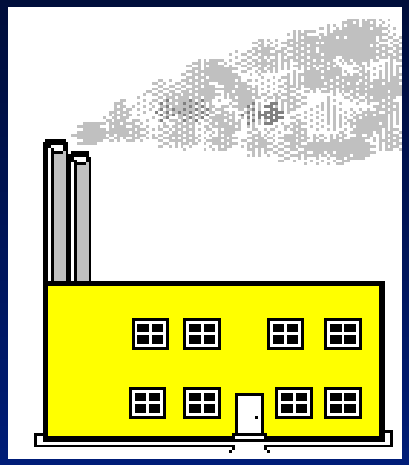
Sources of Temporal Data

- CEFS CATDAY Table
  - Can be updated with data from districts, special studies, and other sources
- CEFS CATHOUR Table
  - Can be updated with data from districts, special studies, and other sources

Development of Temporal Profiles

- CEIDARS Tables are Primary Source
- Monthly Fractions, DPWK and HPDY Fields Need to be Populated
- Very Important to have Monthly Fraction Data for Intermittent Sources

Example of an Intermittent Source



BOILER

CEIDARS Process Data:

SCC = 10200501, SIC = 2951

Hours/Day = 8

Days/Week = 7

Weeks/Year = 17

Relative Monthly Throughput

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					.25	.25	.25	.25			

Old Calculation Method for Seasonal Emissions

- Point Sources

SEMS (t/d) = EMS (t/y) / {OP_DAY * WEEK_YR}

Where:

SEMS = Seasonal emissions (tons/seasonal day)

EMS = Annual Emissions (tons/year)

OP_DAY = # days of operation per week

WEEK_YR = # operating weeks per year

Old Calculation Method Intermittent Source

- Point Sources

  SEMS (t/d) = EMS (t/y) / {OP_DAY * WEEK_YR}

  SEMS (t/d) = 1000 / { 7*17 }

  SEMS (t/d) = Summer (t/d) = Winter (t/d) = 8.403

  EMS (t/d) = EMS (t/y) / 365 = 1000 / 365 = 2.740

Seasonal Emissions are 3 Times Larger than Annual Emissions!!

New Calculation Method

(not implemented yet!)

SEMS (t/d) = EMS (t/y) * TF

Where:

SEMS = Seasonal emissions (tons/seasonal day)

EMS = Annual Emissions (tons/year)

TF (Temporal Factor) = SEAS_FRAC / 182.5

SEAS_FRAC = (i) Sum of fractional monthly throughputs
Summer: May-October
Winter: November-April

or (ii) The ratio of the operating days in the season to the operating days in the year

New Calculation Method Intermittent Source

SEMS (t/d) = EMS (t/y) * TF

Summer EMS (t/d) = 1000 * {.25 + .25 + .25 + .25} / 182.5

Summer EMS (t/d) = 5.479

Winter EMS (t/d) = 1000 * { 0 } / 182.5

Winter EMS (t/d) = 0

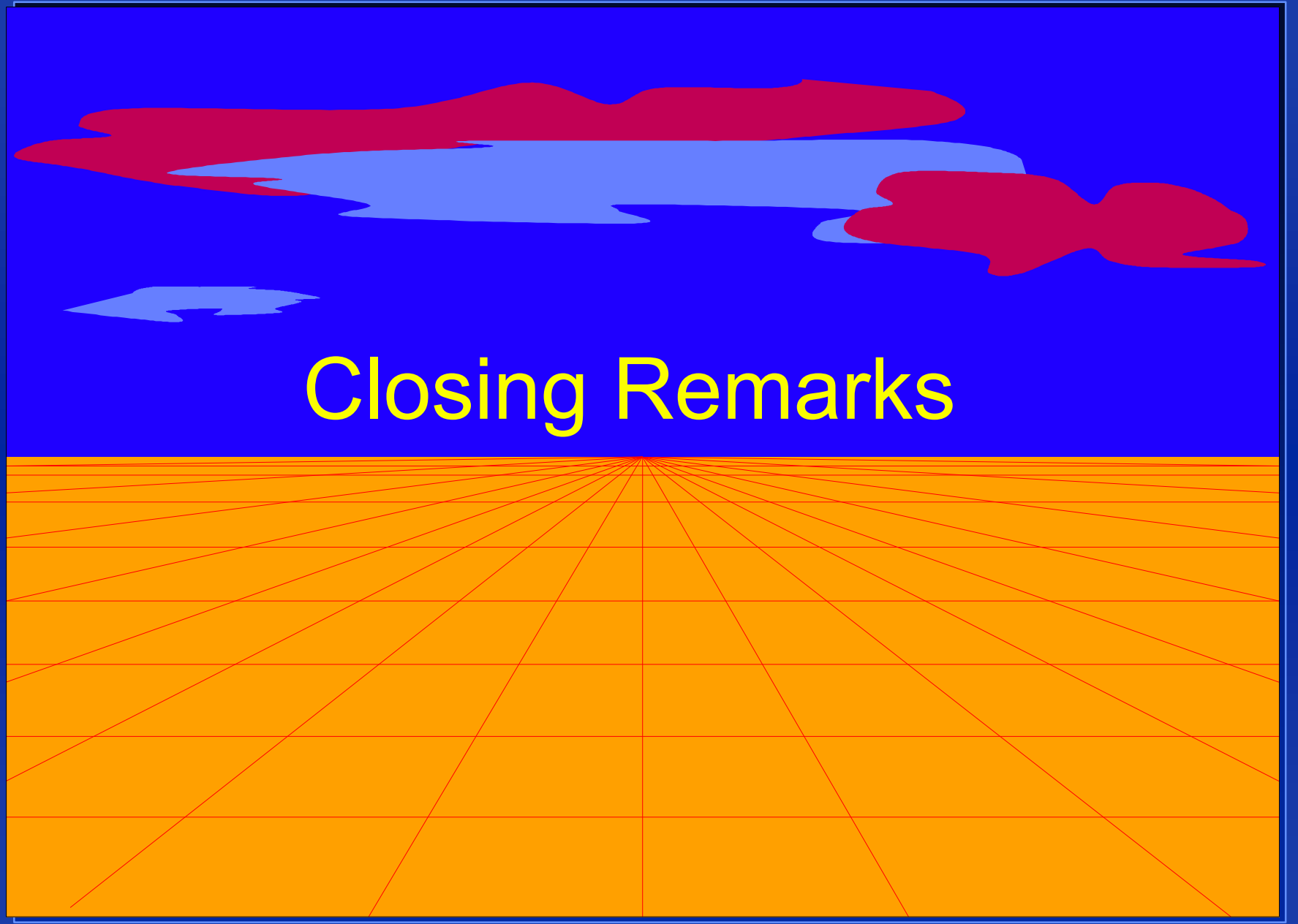
With this method, calculated seasonal emissions more accurately reflect real world operation

Help in Developing Temporal Profiles

- Existing Temporal Data in CEIDARS
- Data Sources such as Permit Conditions, Facility Surveys, and Special Studies
- Emission Inventory Procedural Manual, Volume I defines Codes for DPWK and HPDY - New Codes can be Created as Needed

Summary

- ARB will Populate Table MONTH and CATMONTH with data from CEIDARS
- Uniform Activity will be Assigned where Monthly Fractions are all Zero or Null
- Districts should update CEIDARS with Actual Monthly Fraction Data, DPWK and HPDY


Closing Remarks

CEFS Forecasting Summary

FY = BY x GF x CF x TF

CEFS Projection Equation

CEFS projects emissions for various years, called Future Year (FY) emissions, by using 4 basic components detailed below:

Base Year (BY)

CEFS requires a starting point to forecast and backcast emissions from. The base year provides this starting point. This is a single year chosen from the CEIDARS database. In order to work properly, the base year emissions must be actual emissions for that year, so methodologies used to determine the base year emissions must take controls into account as CEFS assumes all emissions in the base year are fully controlled to that year. The CEFS system then takes this base year emissions data and projects it into the future (forecast) or into the past (backcast).

The ARB always prefers to use the most accurate data possible, and so CEFS provides the default data for forecasts and backcasts, but if better, directly reported data exists, CEFS will overwrite its data with this. This often occurs in the case of backcasting. CEFS will backcast data when it is believed that the current base year methodology is superior to older data, but when existing data for past years is available and of good quality, CEFS will use this data in place of its backcasts. Sometimes a base year is chosen which is not the most current data, because it is believed to be the best data. In these cases, it may be that even some forecasted years will be replaced by current data rather than keeping the CEFS projection. But in general, from a single base year, CEFS will determine all other years of interest, usually in the 1975-2020 range.

Growth Factor (GF)

In order to project the base year data to other years of interest, CEFS uses data gathered from various sources to predict trends in growth. This can include forecasts of fuel consumption, population growth projections, predictions of housing construction rates, and economic trends. This growth data is then related to the inventory categories and regions through surrogates of some kind, called growth parameters. For example, if consumer products are linked to population, then consumer product emissions will grow as population grows, and so consumer product categories will be assigned the population growth parameter. Once a comprehensive set of growth parameters and growth factors are established, then CEFS can use them to grow the emissions into various years.

It is important to note that the GF is a relative factor related to the base year. The GF for the base year itself will therefore always be 1, and all other year GFs will be related to 1 based on how much growth occurs from the base year to that projected year. So if a category grew from the base year to a certain future year by 80%, then the GF for this future year would be 1.80, 80% bigger than the GF 1 for the base year.

Control Factor (CF)

In order to take into account not just growth but also changes in the emissions of categories due to control measures impacting them, CEFS also needs to develop a CF. CFs are determined by CEFS based on data that relates control measure impacts to the categories and regions they affect. Each control measure is assigned a control profile, which relates that measure's emissions reductions to those categories that it will impact

as well as those regions in which it will have jurisdiction. This profile is specific to each pollutant and to each year, so that measures that affect more than one pollutant and have impacts based on the year in question can adequately be represented. Control profiles are developed by the agency in charge of the control measure in question. So the districts will develop control profiles for their rules and the ARB will do likewise for its rules.

The CF is a relative factor related to the base year just as the GF is. The CF for the base year itself will therefore always be 1, and all other year CFs will be related to 1 based on how much control occurs from the base year to that projected year. So if a category were required to reduce its emissions by 90% from the base year by a certain future year, then the CF for this future year would be 0.10, a 90% reduction from the CF 1 of the base year.

While GFs are unique to a category and region, CFs may not be. It is possible to have several measures impact the same category in the same region for the same pollutant and in the same year. For example, if the ARB issues a rule that cleans up diesel fuel sulfur content which results in reduced diesel PM emissions by 10% in a certain year and the local district also issues a diesel PM rule that requires a reduction in diesel PM of 80% in the same year, then both rules affect the diesel PM category for that region and this would result in a double impact. The CEFS system will simple multiply all relevant CFs together to obtain a final composite CF for the category, region, pollutant and year. In this example, the composite CF would be 0.90 (the 10% reduction from ARB's rule) x 0.20 (the 80% reduction from the district's rule) = 0.18, or a net result of 82% reductions in diesel PM overall.

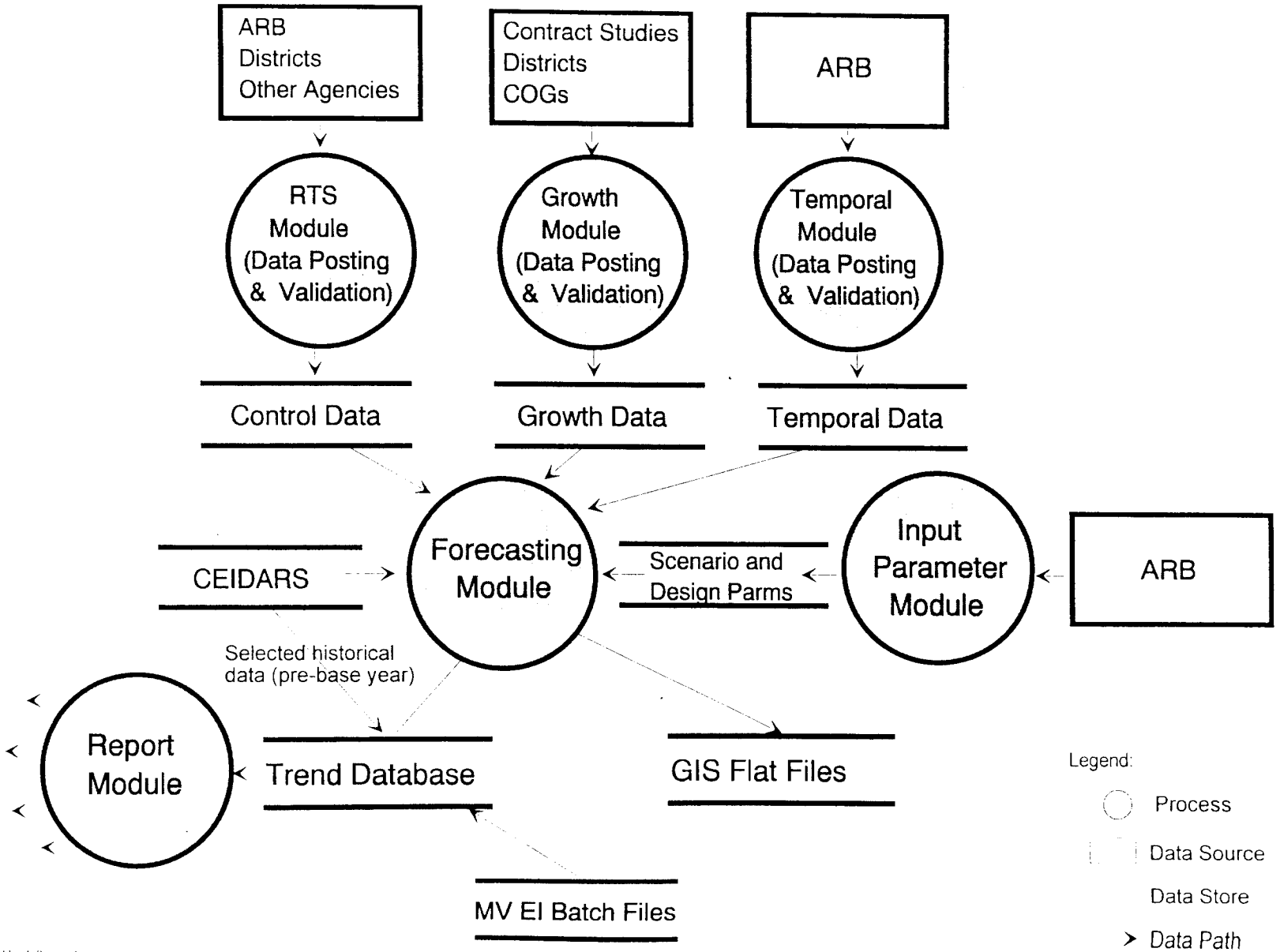
Temporal Factor (TF)

The final factor CEFS uses to account for emissions in a projected year, is the TF. This factor is used as an adjustment factor to adjust emissions from the standard annual average reporting of CEFS into a summer or winter seasonal emissions reporting format. When reporting data to be modeled, CEFS can also report TF adjustments to give specific month of the year emissions, day of the week emissions (weekend vs. weekday), or even hour of the day emissions. All these adjustments rely on CEIDARS temporal data input.

Month fractions in CEIDARS determine the seasonal emissions TFs as well as the specific month of the year TF for modeling data. The Weeks per Year, Days per Week and Hours per Day fields in CEIDARS are used for the other modeling TFs.

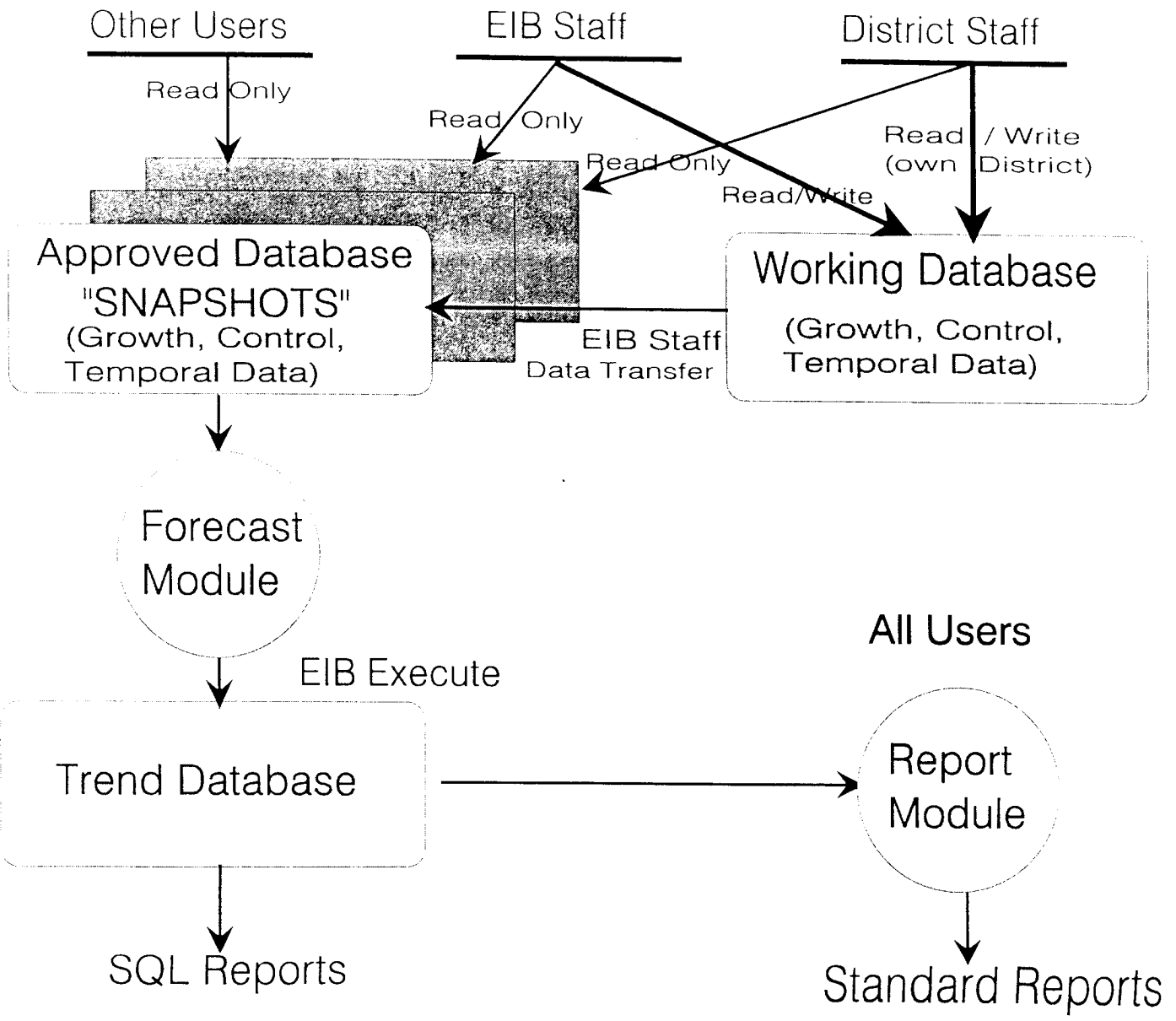
Unlike CFs and GFs, TFs are not specific to a year but are the same as those for the base year and CEFS assumes these TFs do not change for other years.

CEFS Module View



b:\data\sptrack\cefsflow.grf

CEFS--Working vs. Approved Database Concept



h:\data\sptrack\cefsflow.grf

DESCRIPTION FOR TABLE forecast

COL	COL NAME	TYPE	WIDTH	DEC	NULLS	DESCRIPTION
	SCENARIO	VARCHAR2	16		NOT NULL	Scenario Name
2	BASEYEAR	NUMBER	4	0	NOT NULL	Base Inventory Year
3	FYEAR	NUMBER	4	0	NOT NULL	Forecast Year
4	DIS	VARCHAR2	3		NOT NULL	District
5	AB	VARCHAR2	3		NOT NULL	Air Basin
6	CO	NUMBER	2	0	NOT NULL	County Number
7	SCC	NUMBER	14	0	NOT NULL	SCC or SCC6 or SCC3 Code
8	SIC	NUMBER	14	0	NOT NULL	SIC Code
9	POLN	VARCHAR2	5		NOT NULL	Pollutant Code
10	EIC	NUMBER	14	0	NULL	EIC Code
11	GROWTH_PARAM	VARCHAR2	12		NULL	Growth Parameter
12	GROWTH_FACTOR	NUMBER	7	3	NOT NULL	Growth Factor
13	AA_CF	NUMBER	7	3	NOT NULL	Control Factor for Annual Average
14	SUMMER_CF	NUMBER	7	3	NOT NULL	Control Factor for Summer
15	WINTER_CF	NUMBER	7	3	NOT NULL	Control Factor for Winter
16	SUMMER_TF	NUMBER	7	3	NOT NULL	Temporal Factor for Summer
17	WINTER_TF	NUMBER	7	3	NOT NULL	Temporal Factor for Winter
18	FRAC	NUMBER	5	4	NULL	Fraction of ROG/PM10/NOX
19	FRACVOC	NUMBER	5	4	NULL	Fraction of VOC/PM2.5
20	TYPE	VARCHAR2	2		NOT NULL	Source Type
21	AAEMS	NUMBER	10	4	NOT NULL	Annual Average Emission
22	SUMEMS	NUMBER	10	4	NOT NULL	Summer Emission
23	WINEMS	NUMBER	10	4	NOT NULL	Winter Emission
24	BASEYREMS	NUMBER	10	4	NOT NULL	Base Year Emission
25	SCEN_DATE	DATE			NULL	Scenario Date
26	NONATTAIN	VARCHAR2	10		NULL	Non Attainment Area Code
27	SUBCO	VARCHAR2	4		NULL	Sub-County
28	CES	NUMBER	5	0	NULL	CES Code

CEFS Rule Tracking System (RTS)
Control Profile Development -- Data Requirements
Guidance Document

Definition

A "*control profile*" describes how a regulatory action (e.g. ARB or district control regulation) or a technological change (e.g. improved diesel engine technology) impacts an emission source category over time. "Rule" and "Measure" will be used interchangeably.

A "Common Denomenator" for Control Profiles

The California Emission Forecasting System (CEFS) uses linear control scalers to express these control changes over time. These are "unit-less" factors which when applied (and combined with growth factors) will predict the projected future emission levels (or backcasted emission levels if running in reverse).

Control Data Origins

Control requirements can generally be expressed in one of four ways:

1) Tonnage Reduction--expressed in tons of emissions
2) Performance Level (or control efficiency requirement)--expressed as a percent reduction)
3) Emission Standard (e.g. VOC limits for architectural coatings in grams/liter)
4) Technology Change (e.g. advancements in diesel engine technology)

Since control information originates from regulations and/or technology advancements, all control profile develpment begins here. Since CEFS relies on a single common denomenator (a "unit-less" control scaler for all control profiles as described above) the various ways in which rules specify emission reduction requirements must all be reduced to this common denomenator.

RTS Data Management Issues

Although each rule will have a unique set of years (stored in the CONTROL LEVEL YEAR field of the CONTROL_DATA table) represented in its profile to characterize the implementation periods of the rule, CEFS needs the user to establish a reference year in which every rule is represented for the agency. As an example, the user could choose 1987 as the reference year (setting the control level to 1.0). All rules would then need to have a 1987 data record included as part of the profile. CEFS needs this common reference to perform global interpolation for all the control records in the data set.

Depending on how the regulation is written regarding implementation of the measure, the control profile will reflect either a "step" function or a "smooth" phase-in of the measure. This will determine how the control profile is constructed and how CEFS performs interpolation of control level data for years in between the years which have been posted to the system as "raw" data.

Since CEFS accounts for "*growth*" as a separate variable, control profiles should be constructed independently of growth effects. The forecast model itself will account for the anticipated growth. The districts can opt to add/update the growth data via the CEFS Growth Module.

Comments and Guidance on Data Fields:

CEFS uses two primary data tables to store control rule information:
1 RULE_DESC table which stores general information about the rule--a relatively small file; and 2) CONTROL_DATA which stores the control profile information by region and emission source category--a relatively large file.

The batch file formats for RULE_DESC and CONTROL_DATA are standard transaction formats that serve a dual purpose: 1) It feeds control information at the source category level (e.g. SCC/SIC or EIC etc.) for forecasting and planning inventory preparation; and 2) It feeds control information into GIS forecasting routines which prepare facility specific daily and hourly emission inventories used for modeling. Facility specific control information is reserved for the GIS forecasting routine.

CEFS' RTS employs a sophisticated control hierarchy scheme (see Figure 1) enabling the user to post and apply control profiles at various emission inventory category levels. A good understanding of this hierarchy is critical for the successful application of the CEFS algorithm and interpretation of reported future year emission inventories. The data hierarchy is explained with examples under the description of the CAT SELECTION FLAG field in the CEFS-CONTROL_DATA table description that follows.

Field Descriptions for CEFS--RULE_DESC Table:

AGENCY: The agency field contains the abbreviated agency name (e.g. SAC_AQMD, SJU_APCD) proposing or adopting the measure. This name is validated from the AGENCY lookup table.

RULENO: The rule number will support whatever naming convention is used by the author agency (to offer flexibility). The RULENO field is validated against the RULENO field in the CONTROL_DATA data table.

RULE TITLE: The rule title for the rule.

DESCRIPTION: Further description of the rule if necessary

STATUS: (A)dopted or (P)roposed flag

INTERPOLATION FLAG: (S)tep or (L)inear interpolation flag

BASED ON ARB REG: (Y) or (N)

ADOPT YEAR: Year the rule was adopted (1970 to current year)

IMPLEMENT YEAR: The first year of implementation (1970 to 2030)

RULE BASE YEAR: Initial benchmark year for calculating emission reductions

SSD SECTION: ARB Use

SSD PERSON: ARB Use

AGENCY CONTACT PERSON: The agency (e.g. District) contact person for the rule

NO OF POLLUTANTS: The number of pollutants which the rule applies (up to 5)

POLN1*: Pollutant name for the 1st pollutant

POLN2*: Pollutant name for the 2nd pollutant

POLN3*: Pollutant name for the 3rd pollutant

POLN4*: Pollutant name for the 4th pollutant

POLN5*: Pollutant name for the 5th pollutant

* Valid Pollutants ('TOG', 'NOX', 'CO', 'SOX', 'PM')

The CEIDARS inventory stores TOG and PM (ROG and PM10 are calculated values). CEFS uses these names to link to CEIDARS emissions data. However, the control profile for hydrocarbon controls will typically be derived from emission reductions imposed on ROG not TOG. In like manner, the control profile for particulate matter will typically be based on regulatory actions requiring reductions in PM10 not PM. Unless there is a particular need to look at the reductions in TOG or PM, it is advised to develop the profiles based on ROG and PM10 respectively.

BATCH FILE FOR CEFS-RULE_DESC TABLE

Field Name	Field Type	Field Length	Start Column	End Column
AGENCY	CHAR	10	1	10
FILL	CHAR	1	11	11
RULENO	CHAR	10	12	21
FILL	CHAR	1	22	22
RULE TITLE	CHAR	50	23	72
FILL	CHAR	1	73	73
DESCRIPTION	CHAR	60	74	133
FILL	CHAR	1	134	134
STATUS	CHAR	1	135	135
FILL	CHAR	1	136	136
INTERPOLATION FLAG	CHAR	1	137	137
FILL	CHAR	1	138	138
BASED ON ARB REG	CHAR	1	139	139
FILL	CHAR	1	140	140
ADOPT YEAR	NUMERIC	4	141	144
FILL	CHAR	1	145	145
IMPLEMENT YEAR	NUMERIC	4	146	149
FILL	CHAR	1	150	150
RULE BASE YEAR	NUMERIC	4	151	154
FILL	CHAR	1	155	155
SSD SECTION	CHAR	20	156	175
FILL	CHAR	1	176	176
SSD PERSON	CHAR	20	177	196
FILL	CHAR	1	197	197
AGENCY CONTACT PERSON	CHAR	20	198	217
FILL	CHAR	1	218	218
NO OF POLLUTANTS	NUMERIC	1	219	219
FILL	CHAR	1	220	220
POLN1	CHAR	5	221	225
FILL	CHAR	1	226	226
POLN2	CHAR	5	227	231
FILL	CHAR	1	232	232
POLN3	CHAR	5	233	237
FILL	CHAR	1	238	238
POLN4	CHAR	5	239	243
FILL	CHAR	1	244	244
POLN5	CHAR	5	245	249
FILL	CHAR	1	250	254
END OF RECORD MARKER	"."	1	255	255

Mandatory Fields - AGENCY, RULENO, RULE TITLE, STATUS, INTERPOLATION FLAG, 'BASED ON ARB REG', 'NO OF POLLUTANTS', POLN1, POLN2, ...POLN5

Field Descriptions for CEFS-CONTROL_DATA Table:

AGENCY: The agency field contains the abbreviated agency name (e.g. SAC_AQMD, SJU_APCD) proposing or adopting the measure. This name is validated from the AGENCY lookup table.

RULENO: The rule number will support whatever naming convention is used by the author agency. The RULENO field is validated against the RULENO field in the RULE_DESC data table so it must match an existing rule number in that table.

REGION SELECTION FLAG: The flag determines what combination of regions are within the rule jurisdiction. For example, if a rule applies to the entire district, then option '6' is used. If the rule applies differently among the counties within the district, then option '2' should be employed.

re:Flag Option 1: Currently emission inventory data are only available at the county level. Therefore, sub-county level rule information will only apply after CEIDARS is populated with subcounty level emission data.

DISTRICT: District alpha code must be entered when REGION SELECTION FLAG set to '1', '2' or '6' else the column can be left blank.

AIRBASIN: Air Basin alpha code must be entered when REGION SELECTION FLAG set to '1', '2, '3' or '5' else the column can be left blank.

COUNTY: County numeric code must be entered when REGION SELECTION FLAG set to '1', '2, '3' or '4' else the column can be left blank.

SUBCOUNTY: Future use. Leave blank.

NA AREA: Future Use. Leave blank.

CAT SELECTION FLAG: The flag determines what combination of emission categories (i.e. SCC/SIC/EIC/CES codes) to be associated with the rule

Since there are so many emission process and industry combinations in the inventory, CEFS uses a hierarchical scheme **(see Figure 1)** for linking and applying emission control information. For a given rule, the system seeks, selects, and applies the control data only at the highest level of the hierarchy. The commentary below addresses how CEFS accomplishes this. (also see the table entitled CEFS-Category Selection Hierarchy at the end of this section).

Areawide and Stationary Aggregated Sources:

We recommend using the EIC code option '10'. The CES code (Option '11') is also currently supported, however, in the future ARB is moving away from its use. An example of a typical category that is entirely based on an areawide profile would be architectural coatings. EIC's which have a mixture of point and area source categories are discussed below.

Point Sources:

We recommend using the SCC (option '7') as the top layer for control for point sources since most regulations are process driven (e.g. a rule specifying NOx emission limits from all commercial boilers) and are often applied to all industry types the same way. For particular industries (identified by SIC)which may have restrictions which are different for the same emission process, option '4' (the SCC/SIC combination level) can be used to apply these controls. Some rules also apply similarly across groups of SCC's. CEFS supports this by allowing control data to be entered at the SCC 3-digit or 6-digit level. Options '6' and '7' handle this but the SIC must be included with these options.

EIC's Which Contain a Mixture of Point and Areawide (or Stationary Aggregated Sources)

Example: Control Profiles for Vapor Degreasing: EIC: 220,206,8106,0000

Suppose a control profile is developed for the entire degreasing EIC category above. For EIC categories such as this, the categories may include emissions estimated as point and area sources. If control profile information is known for the point source processes within this EIC category, unique control profiles can be defined at the SCC or SCC/SIC combination level (e.g. SCC:40100398 (Cold Cleaning Solvent) and SIC: 3479 (Fabricated Metal Products)). CEFS will apply this layered control data without double counting the reductions. The profiles at the SCC (or SCC/SIC) level will be applied for the respective categories first since the SCC/SIC levels are higher in the data hierarchy than the EIC level, and the control profile posted in CEFS at the EIC level will be applied to the balance of the degreasing categories (i.e. all SCC/SIC combinations that do not have unique profiles posted, as well as the area source portion of the degreasing EIC category).

FACID: for ARB use. Leave blank.

SCC: Source Classification Code(SCC) field is 14 characters wide (for compatibility with CEIDARS). The numeric 8-digit SCC code should be right justified. The field must be entered when CATEGORY SELECTION FLAG set to '4', '5, '6' or '7' else the column can be left blank.

SIC: Standard Industrial Classification (SIC) field is 14 characters wide (for compatibility with CEIDARS). The numeric 4-digit SIC code should be right justified. The field must be entered when CATEGORY SELECTION FLAG set to '4', '5, '6', or '8' else the column can be left blank.

EIC: Emission Inventory Code (EIC) field is 14 characters wide (for compatibility with CEIDARS). The numeric 14-digit EIC code (some codes are 13 digits) should be right justified. The field must be entered when CATEGORY SELECTION FLAG set to '3', '9, or '10' else the column can be left blank.

CES: Category of Emission Source (CES) field is 6 characters wide (for compatibility with CEIDARS). The numeric 6-digit CES code should be right justified. The field must be entered when CATEGORY SELECTION FLAG set to '11' else the column can be left blank.
Note: The CES code is being phased out by the EIC code.

EICMAT: NOT USED. Leave blank

CONTROL CODE: NOT USED. Leave blank

BASE INVENTORY YEAR: The CEIDARS inventory year which the rule is being linked. Since the universe of emission inventory categories may change from one calendar year to the next, this can cause rule-source category relationships to change. CEFS does not yet map these rule-source category changes over time, however, the field still offers the user a reference year for tracking these linkages.

POLN: The pollutant name ('TOG', 'NOX', 'CO', 'SOX', 'PM')
CEIDARS inventory stores TOG and PM (ROG and PM10 are calculated values). CEFS uses these names to link to CEIDARS emissions data. However, the control profile for hydrocarbon controls will typically be derived from emission reductions imposed on ROG <u>not</u> TOG. In like manner, the control profile for particulate matter will typically be based on regulatory actions requiring reductions in PM10 <u>not</u> PM. Unless there is a particular need to look at the reductions in TOG or PM, it is advised to develop the profiles based on ROG and PM10 respectively.

SEASON: Identifies the season for controls; A-All(default), S-Summer, W-Winter

CONTROL LEVEL YEAR: This is one year (in the series of years) which define the control profile (see comments regarding setting a reference year above). CONTROL LEVEL YEAR must be > 1970

CONTROL FLAG **Set this flag to 'R' for 'R'emaining**

Note: CONTROL LEVEL is defined as the fraction of remaining emissions.

CONTROL LEVEL (CL) The technological control efficiency
Range:0.001 to 9.999

RULE EFFECTIVENESS (RE) "Real World" adjustment factor for rule compliance effectiveness expressed as decimal fraction (0.8 is a common estimate)
Range: 0.000 to 1.000 (default is 1.0)

RULE PENETRATION (RP) The fraction of the emission category in which the rule actually penetrates
Range: 0.000 to 1.000 (default is 1.0)

The effects of CL, RE, and RP are often combined into a single factor. In these cases, the RE and RP should be set to 1.0. If a combined factor is employed, it should be entered in the CL field.

BATCH FILE FOR CEFS-CONTROL_DATA
(Fields in **BOLD** can be utilized)

Field Name	Field Type	Field Length	Start Column	End Column
AGENCY	CHAR	10	1	10
FILL	CHAR	1	11	11
RULENO	CHAR	10	12	21
FILL	CHAR	1	22	22
REGION SELECTION FLAG	NUMERIC	1	23	23
FILL	CHAR	1	24	24
DISTRICT	CHAR	3	25	27
FILL	CHAR	1	28	28
AIRBASIN	CHAR	3	29	31
FILL	CHAR	1	32	32
COUNTY	NUMERIC	2	33	34
FILL	CHAR	1	35	35
SUBCOUNTY	CHAR	4	36	39
FILL	CHAR	1	40	40
NA AREA	CHAR	10	41	50
FILL	CHAR	1	51	51
CAT SELECTION FLAG	NUMERIC	2	52	53
FILL	CHAR	1	54	54
FACID	NUMERIC	9	55	63
FILL	CHAR	1	64	64
SCC	NUMERIC	14	65	78
FILL	CHAR	1	79	79
SIC	NUMERIC	14	80	93
FILL	CHAR	1	94	94
EIC	NUMERIC	14	95	108
FILL	CHAR	1	109	109
CES	NUMERIC	6	110	115
FILL	CHAR	1	116	116
EICMAT	CHAR	4	117	120
FILL	CHAR	1	121	121
CONTROL CODE	CHAR	3	122	124
FILL	CHAR	1	125	125
BASE INVENTORY YEAR	NUMERIC	4	126	129
FILL	CHAR	1	130	130
POLN	CHAR	5	131	135
FILL	CHAR	1	136	136
SEASON	CHAR	1	137	137
FILL	CHAR	1	138	138
CONTROL LEVEL YEAR	NUMERIC	4	139	142
FILL	CHAR	1	143	143
CONTROL FLAG	CHAR	1	144	144
FILL	CHAR	1	145	145
CONTROL LEVEL (CL)	NUMERIC	5	146	150
FILL	CHAR	1	151	151
RULE EFFECTIVENESS (RE)	NUMERIC	5	152	156
FILL	CHAR	1	157	157
RULE PENETRATION (RP)	NUMERIC	5	158	162
FILL	CHAR	2	163	164
END OF RECORD MARKER	"."	1	165	165

Mandatory Fields - AGENCY, RULENO, REGION SELECTION FLAG (with associated regions specified, i.e. District/Air Basin/County etc), CAT SELECTION FLAG (with associated categories specified, i.e. SCC/SIC/EIC etc.) POLN, CONTROL LEVEL YEAR, CONTROL LEVEL.

Figure 1

CEFS - Region Selection Hierarchy

REGION SELECTION FLAG	DISTRICT	AIRBASIN	COUNTY	SUBCOUNTY*
1	X	X	X	X
2	X	X	X	
3		X	X	
4			X	
5		X		
6	X			
7(state level)				

* Emission data are not currently maintained at SUBCOUNTY level in CEIDARS.

CEFS-Category Selection Hierarchy

CATEGORY SELECTION FLAG	*FACID	SCC	SIC	EIC	CES
1*	X	X	X		
2*	X				
3*	X			X	
4		X	X		
5		X(6dgt)	X		
6		X(3dgt)	X		
7		X			
8			X		
9			X	X	
10				X	
11					X
12**			X(2dgt)		
13*	X		X	X	

*FACID - Used for GIS forecast system only.
** 2-digit SIC reserved for growth profiles only.

CEFS Control Data
Table Relationships

DESCRIPTION FOR TABLE rule_desc

L	COL NAME	TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	AGENCY	VARCHAR2	10		NOT NULL	Agency Code
2	RULENO	VARCHAR2	10		NOT NULL	Rule Number
3	RULETITLE	VARCHAR2	50		NOT NULL	Rule Title
4	RULEDESC	VARCHAR2	60		NULL	Rule Description
5	STATUS	VARCHAR2	1		NULL	Rule Adopted or Proposed
6	ADOPTYEAR	NUMBER	4	0	NULL	Rule Adoption Year
7	INTERPOL_FLAG	VARCHAR2	1		NULL	Interpolation Linear or Step
8	ARB_REG	VARCHAR2	1		NULL	ARB Regulated rule Y/N
9	IMPYEAR	NUMBER	4	0	NULL	Implementation Year
0	RULE_BYR	NUMBER	4	0	NULL	Rule Base Year / SSD Form
1	SSD_SECTION	VARCHAR2	20		NULL	Stationary Source Div. Section
2	SSD_PERSON	VARCHAR2	20		NULL	SSD Contact Person Name
3	AGENCY_PERSON	VARCHAR2	20		NULL	Agency Contact Person Name
4	USERID	VARCHAR2	8		NOT NULL	User ID
5	RULEUPDATE	DATE			NOT NULL	Rule Update
6	SOURCE_DIS	VARCHAR2	3		NOT NULL	

DESCRIPTION FOR TABLE control_data

COL	COL NAME	TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	AGENCY	VARCHAR2	10		NOT NULL	Agency Code
2	RULENO	VARCHAR2	10		NOT NULL	Rule Number
3	POLN	VARCHAR2	5		NOT NULL	Pollutant Code
4	REGION_ID	VARCHAR2	14		NOT NULL	Region Number
5	CATEGORY_ID	VARCHAR2	40		NOT NULL	Category Number
6	YEAR	NUMBER	4	0	NOT NULL	Year of Control Level
7	NONATTN	VARCHAR2	10		NULL	Non Attainment Area Code
8	SEASON	VARCHAR2	1		NULL	Season Flag
9	EICMAT	NUMBER	4	0	NULL	EIC Material Code
10	CONTROL_CODE	NUMBER	3	0	NULL	Control Code
11	BASE_INV_YEAR	NUMBER	4	0	NULL	CEIDARS EI Year: Categorization
12	CONTROL_LEVEL	NUMBER	5	3	NOT NULL	Control Level
13	RULEEFFECT	NUMBER	5	3	NULL	Rule Effectiveness Factor
14	RULEPENETRATE	NUMBER	5	3	NULL	Rule Penetration Factor
15	USERID	VARCHAR2	8		NOT NULL	User ID
16	UPDATE_DATE	DATE			NOT NULL	Update Date
17	SOURCE_DIS	VARCHAR2	3		NOT NULL	

DESCRIPTION FOR TABLE region_type

L	COL NAME	TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	REGION_ID	VARCHAR2	14		NOT NULL	Region Number
2	REGION_FLAG	NUMBER	1	0	NULL	Region Selection Flag
3	DIS	VARCHAR2	3		NULL	District
4	AB	VARCHAR2	3		NULL	Air Basin
5	CO	NUMBER	2	0	NULL	County Number
6	SUBCO	VARCHAR2	4		NULL	Sub-County

DESCRIPTION FOR TABLE category_type

COL	COL NAME	TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CATEGORY_ID	VARCHAR2	40		NOT NULL	Category Number
2	CATEGORY_FLAG	NUMBER	2	0	NULL	Category Selection Flag
3	FACID	NUMBER	9	0	NULL	Facility ID
4	SCC	NUMBER	14	0	NULL	SCC or SCC6 or SCC3 Code
5	SIC	NUMBER	14	0	NULL	SIC Code
6	EIC	NUMBER	14	0	NULL	EIC Code
7	CES	NUMBER	6	0	NULL	CES Code

Hypothetical Problem for Control Profile Development

(For use with the California Emission Forecasting System (CEFS))

Rule Type: Large Water Heaters and Small Boilers

l:\data\siptrack\problem1.wpd

Background:

The Clear Sky Unified Air Pollution Control District is considering adopting a new rule RXXXX.X to establish NOx emissions standards for two size ranges of boiler units in order to meet a previous SIP commitment.

TYPE 1:Between 75,000 and 400,000 BTU/Hour heat input.
TYPE 2: Between 400,000 and 2,000,000 BTU/Hour heat input.

The rule specifies a phased implementation plan for retrofit and replacement of boilers and will require the boilers in these size categories to certify to an emission standard of 0.037 pounds NOx per million BTU.

Precontrolled Emission Rates:

The precontrolled emission rates are: 0.137 pounds for TYPE 1 and 0.17 pounds for TYPE 2.

Implementation Schedule:

By 2000: All new boilers sold must meet the 0.037 standard.
By 2002: All boilers manufactured prior to 1992 must be replaced or retrofitted to meet the emission standard.
By 2005: All boilers manufactured between 1992 and 1999 must be replaced or retrofitted to meet the standard.

Task:

Develop a control Profile for use in the ARB's forecasting model to predict what the future emissions will be for these boilers to see if the SIP commitment is attainable based on these boiler combustion technology constraints. The control profiles MUST BE determined independently of growth since CEFS accounts for growth in the forecast model. You may assume that the Rule Effectiveness (RE) is 100%. Although the rule mandates 100 percent compliance at the key implementation years, it is safe to assume that conversion to the new equipment will take longer than expected. State all assumptions.

Emission Inventory Analysis:

The district emission inventory staff has been consulted by the rules engineer to find our what emission categories are hit by the rule. It is assumed that all boilers are categorized as area sources due to their relatively small size. The following categories were found to apply:

CES Codes:

47142: Industrial Natural Gas Combustion (Unspecified)
47159: Commercial Distillate Oil Combustion
47167: Commercial Natural Gas Combustion (Unspecified)
58727: Commercial LPG Combustion
58735: Commercial Natural Gas Combustion - Space Heating
58743: Commercial Natural Gas Combustion - Water Heating
66795: Industrial LPG Combustion

The 1996 emission inventory for all of the boilers in the categories shows 5000 tons of NOx per year. Review of the emission inventory methodology for these categories indicate that the emissions are shared between the TYPE 1 and TYPE 2 boiler groups are 2000 tons and 3000 tons respectively. A survey of these source categories confirms this. The review also showed that the rule has a 98 percent penetration rate for the group of categories as a whole (see the RP factor for 2015 in the table below).

Note: In this example, we are treating the source categories (all the CES's above) as a group because the rule penetration is high for all the categories. If the rule penetration varies significantly across categories, then it may warrant developing a profile for each CES separately.

Calculation of Average Control Efficiency

The control efficiency reflects the change in emission rate resulting from a technology change. Each new boiler which comes on-line is assumed to perform at the same efficiency. Therefore, the control efficiency factor is a fixed value in the control Profile equation.

$$CE = \frac{CE1_{TYPE1}(EMS_{TYPE1}) + CE1_{TYPE2}(EMS_{TYPE2})}{EMS_{TOTAL}}$$

$$CE = \frac{(1-(.037/.137)) * 2000 + \{1-(.037/.17) * 3000}{5000}$$

CE = 0.761 (fixed value)

Calculation of Rule Penetration and Control Profile:
The rule penetration factor accounts for the phase-in of the rule as old equipment is replaced. The factor also accounts for rule exemptions, and equipment which is already compliant.

Beginning in 2000: It is assumed that the sale of new boilers will result in a natural market driven replacement of 5 percent of the boilers in 2000--Rule Penetration (RP) = 5 percent.

In 2001: An additional 3 percent penetration is assumed to occur in 2001 for a cumulative RP of 8percent.

In 2002: Estimates of the boiler population indicate that approximately 60 percent of the boilers were manufactured prior to 1992. Therefore, the cumulative RP = 60 percent (we have assumed that the boilers replaced prior to 2002 were all pre-1992 models).

In 2005: The last major phase of the rule kicks in. The group of boilers manufactured between 1992 and 1999 are estimated to be approximately 40 percent of the boiler population. However, we will assume that only 25 percent conversion in 2005 with the remaining conversion being linear out to 2015.

The cumulative RP for 2005 is 60 + 25 = 85 percent. As mentioned earlier, the final rule penetration is assumed to be 98 percent at full implementation.

YEAR	CE	RP	RE	CL=1-(CE)(RP)(RE)	
1999	0.76	0.00	1	1.00	
2000	0.76	0.05	1	0.96	
2001	0.76	0.08	1	0.94	
2002	0.76	0.60	1	0.54	
2003	0.76	**0.68**	1	0.48	
2004	0.76	**0.77**	1	0.42	
2005	0.76	0.85	1	0.35	
2006	0.76	**0.86**	1	0.34	
2007	0.76	**0.88**	1	0.33	
2008	0.76	**0.89**	1	0.32	
2009	0.76	**0.90**	1	0.31	
2010	0.76	**0.92**	1	0.30	
2011	0.76	**0.93**	1	0.29	
2012	0.76	**0.94**	1	0.28	
2013	0.76	**0.95**	1	0.27	
2014	0.76	**0.97**	1	0.26	
2015	0.76	0.98	1	0.25	
Underlined years are key implementation phase years					
RP values in BOLD are interpolated					

Sample Control Profile Boiler NOx Rule

Control Level

Notes:
1) The CEFS algorithm reads the CE, RP, and RE factors and calculates the Control Level (CL).

2) Rule penetration can be a valuable factor to retain as a raw forecasting variable in the system because it addresses what fraction of the inventory category is impacted and is handy for tracking the "phase-in" of the rule. In past emission forecasting work, rule penetration has been implied in the final calculated control profile and this piece of information is lost. If the rule penetration factors are not available, then the composite factors (containing the effects of CE, RP, and RE where applicable) can be stored in the CE variable and the RP and RE values can be set to 1.0.

CEFS Growth Data
Growth Profile Development and Data Requirements
Guidance Document

A "**growth profile**" describes how an assigned growth parameter surrogate impacts an emission source category over time.

A Common Denominator for Growth Profiles

The California Emission Forecasting System (CEFS) uses linear growth scalars to express these growth changes over time. These are "unit-less" factors which when applied (and combined with control factors) will predict the projected future emission levels (or backcasted emission levels if running in reverse).

Growth Data Origins

Raw growth data trends can generally be input in the Growth Activity Profile in one of three ways:
1) Activity of a selected parameter
2) Growth Ratios
3) Emissions Tonnage Change -expressed in tons of emissions (only if no control)

Growth Data Management Issues

In order for CEFS to correctly linearly interpolate for all the growth records for a geographic region, each growth profile must contain the activity data for a single reference year. As an example, the user could choose 1990 as the reference year. All profiles for that geographic region would then need to have a 1990 data record included as part of the growth profile.

Since CEFS accounts for "control" as a separate variable, growth profiles should be constructed independently of control effects. The forecast model itself will account for the anticipated control. The districts can opt to add/update the control data via the CEFS Control Module.

Comments and Guidance on Growth Data Fields:

CEFS uses two primary data tables to store growth data information:
1) PAD_DATA table stores the parameter assignment by region and emission "category".
2) GAP_DATA table stores the growth activity information by region and parameter by year.

CEFS employs a sophisticated growth hierarchy scheme enabling the user to post and apply growth profiles at various emission inventory category levels. A good understanding of this hierarchy is critical for the successful application of the CEFS algorithm and interpretation of reported future year emission inventories.

Field Descriptions for CEFS PAD_DATA Table

PAD File Format for Batch Input

Field Name	Mandatory Field	Field Type	Field Length	Start Column	End Column	Valid Values
REGION SELECTION FLAG	X	NUMERIC	1	1	1	
DISTRICT	if rflag=1,2,6	CHAR	3	3	5	
AIRBASIN	if rflag=1,2,3,5	CHAR	3	7	9	
COUNTY	if rflag=1,2,3,4	NUMERIC	2	11	12	
SUBCO	if rflag=1	CHAR	4	14	17	
GROWTH PARAM	X	CHAR	12	19	30	
AGENCY ASSIGNED		CHAR	10	32	41	
CATEGORY SELECTION FLAG	X	NUMERIC	2	43	44	
FACID	reserved for ARB use	NUMERIC	9	46	54	
SCC	if catflag=1,4,5,6,7	NUMERIC	14	56	69	
SIC	if catflag=1,4,5,6,8,9,12	NUMERIC	14	71	84	
EIC	if catflag=3,9,10	NUMERIC	14	86	99	
CES	if catflag=11	NUMERIC	6	101	106	
CAP_ON		CHAR	1	108	108	Y-Yes, N-No
CAP_DESC		CHAR	20	110	129	
CAP	if cap_on=Y	NUMERIC	7	131	137	<10000
PARAMETER COMMENT	recommended use	CHAR	60	139	198	
PARAMETER SOURCE DATE	recommended use	DATE	8	200	207	(MM/DD/YY) format
OLD GROWTH CODE		CHAR	3	209	211	
end of record marker	X	CHAR	1	215	215	period(.)

NOTE: FACID - is for GIS system only. Only ARB users are authorized to add facility specific data.

REGION SELECTION FLAG: This flag code determines what geographical region the growth parameter applies to. For example, if a growth parameter applies to the entire district, then option '6' is used. If the growth parameter applies differently among the counties within the district, then option '2' should be employed.

> re: Flag Option 1: Currently emission inventory data are only available at the county level. Therefore, sub-county level rule information will only apply after CEIDARS is populated with subcounty level emission data.

DISTRICT: District alpha code must be entered when REGION SELECTION FLAG set to '1', '2', or '6' else the column can be left blank.

AIRBASIN: Air Basin alpha code must be entered when REGION SELECTION FLAG set to '1', '2', '3' or '5' else the column can be left blank.

COUNTY: County numeric code must be entered when REGION SELECTION FLAG set to '1', '2', '3' or '4' else the column can be left blank.

SUBCOUNTY: Future use. Leave blank.

GROWTH PARAMETER: Growth parameter name (maximum 12 characters)

AGENCY: The agency field contains the agency that has assigned the growth parameter to the emission source, if it is known.

Emission Forecasting Workshop Evaluation
Fall 2004

1. How useful was this topic to you?
(on a scale of 1 to 5 with 1=not useful and 5=very useful)

TOPIC	RATING				
	1	2	3	4	5
Workshop Overview					
Overview of forecasted, planning, and modeling inventories					
CEFS forecasting system design and analytical capabilites					
Growth data development and transmittal					
Control data development and transmittal					
Temporal data development and transmittal					
Wrap-up and Questions					

2. Quality of presentation - thoroughness; delivery; addressing questions etc.
(on a scale of 1 to 5 with 1=unclear and 5=very clear)

TOPIC	RATING				
	1	2	3	4	5
Workshop Overview					
Overview of forecasted, planning, and modeling inventories					
CEFS forecasting system design and analytical capabilites					
Growth data development and transmittal					
Control data development and transmittal					
Temporal data development and transmittal					
Wrap-up and Questions					

General: Please provide any additional comments pertaining to the usefulness of this workshop. Consider how we can make data submittals easier; what sort of additional web functionality you would like; what additional software might be useful; what kind of additional training or documentation would be helpful.